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Experiences of female engineers working in a male-dominated environment

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EXPERIENCES OF FEMALE ENGINEERS WORKING IN A MALE-DOMINATED ENVIRONMENT

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Abstract

Initial theories of tokenism introduced by Kanter (1977) discuss 3 perceptual phenomena of being a proportional rarity (less than 15% of a given population): higher visibility, exaggeration of differences, and stereotypes/generalizations. The current study explored additional effects of tokenism on female engineers working in a traditionally male dominated field. Data was gathered from an employee opinion survey conducted in a high technology government R&D organization. Planned comparison results show female engineers (tokens) (N=361) are significantly less favorable than male engineers (N=2,212) and non-token females (secretaries) (N=61) on four of the seven predicted work environment factors: job satisfaction, involvement and participation, workplace diversity, and working relationships. Data from this and future studies of women employed in occupations where they are proportionately less than the majority (males), may facilitate the design and implementation of organizational programs to combat tokenism and its negative effects. Recommendations for future research are presented.

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Experiences of Female Engineers Working in a Male-Dominated Environment

Over the past 20 years a considerable number of studies have been devoted to the presence of minorities and women in the workforce and the problems they face. There is growing recognition that the demographic composition of organizations has important effects on employees' work experiences. Theorists have argued that group heterogeneity (Wagner, Pfeffer, & O'Reilly, 1984) and the proportion of women, minorities, or members of other easily identifiable social categories (Crocker & McGraw, 1984; Kanter, 1977) can affect group functioning and the experiences of group members. As the number of women in the labor force increases and as women begin to enter occupations and organizations previously closed to them, it becomes particularly important to understand how the gender composition of organizations or work groups affects the work experiences of men and women.

This study examines the experiences of females working in the male-dominated environment of engineering. Background topics include: workforce demographics, managing diversity, the glass ceiling, stereotyping, performance evaluation, organizational demography, power as it relates to gender, sexual harassment, mentoring, job commitment, job burnout, and the effects women experience when they constitute a small proportion of their particular work group or work environment. The present study focuses on women in engineering because it is a male-dominated white-collar occupation. Further, while most studies of women in engineering have generally involved students rather than engineers in the field, this paper examines the effects of gender in an actual work setting.

Background

Workforce Demographics

Based on the projections presented in the Hudson Institute Workforce 2000 Report authored by Johnston and Packer (1987), the U.S. workforce will consist of an increased number of older workers, more females, and more minority groups by the year 2000. Specifically, between 1987 and the year 2000, only 15% of new entrants to the labor force will be American born white males, while 43% of the new entrants will be American born white females. Further, the Workforce 2000 report estimates 7% of the entrants will be non-white males, 13% non-white females, and the remaining will be immigrant males (13%) and immigrant females (9%).

Managing Diversity

Many organizations are responding to these demographic trends with a "managing diversity" approach (Cox & Blake, 1991). Definitions of diversity tend to include such factors as: gender, race/ethnicity, culture, age, education, disabilities, sexual orientation, religion, language proficiency, marital status, national origin, personality, etc. Cox and Blake (1991) assert that a well managed diverse workforce holds potential competitive advantages for organizations and cite six specific areas in which a diverse workforce can be a competitive advantage: cost, resource acquisition, marketing, creativity, problem-solving, and organizational flexibility. To capitalize on these competitive advantages, however, many authors assert an organization needs to effectively manage diversity by striving to create an organizational culture which is heterogeneous and utilizes maximum participation of all individuals to their full potential (Copeland, 1988; Johnston & Packer, 1987; Thomas, 1991). This is not simply the assimilation of women and people of color into the white male-dominated culture. Rather, it is the creation of a new culture which

allows for equal participation by all individuals, where no one is advantaged or disadvantaged. Mutual respect, acceptance of others, and the desire to work for common goals are stressed through "managing diversity" (Bartz, Hillman, Lehrer, & Mayhugh, 1990). Mere acceptance, tolerance, and understanding of diversity are not enough to enable a diverse group of employees to reach their full potential in the pursuit of corporate objectives (Thomas, 1991).

Moreover, according to Thomas (1991), as minority individuals increase their numbers in the workplace, they are more likely to resist a corporate culture that expects mere assimilation. Hopkins and Hopkins (1991) argue that different languages, values, and beliefs can disrupt and even weaken the existing corporate culture, and several research studies have discovered that a weak corporate culture is associated with poor organizational performance (Bond, 1981; Pascale & Athos, 1981). Consequently, it is likely that if the current corporate culture is not flexible enough to accommodate these differences, an organization's bottom-line as well as its members, will be negatively affected (Gardenswartz & Rowe, 1993; Hopkins & Hopkins, 1991).

The increase in workforce diversity should be seen as an opportunity. According to Copeland (1988), valuing diversity is not just a question of morality, but also a business and economic issue. The challenge is to get employees from different genders, races, and cultural backgrounds to work effectively together (Fernandez, 1991; Morrison, 1992). Organizations possessing cultures which foster and maintain a diverse workforce will undoubtedly have a greater chance for success in the years ahead compared to organizations that do not have such a culture.

According to Thomas (1991), managing diversity is the ultimate step in achieving a diverse workforce. Initially, the organization needs to go through building awareness of diversity throughout the organization and arrive at the state of "valuing differences." At

this point, interpersonal relationships are enhanced, and as a result, blatant expressions of racism and sexism are eliminated (Thomas, 1991). The emphasis is placed on appreciation of differences and creating an environment in which everyone feels valued and accepted (Gardenswartz & Rowe, 1993). An organization is successfully "managing diversity" when it provides a culture that enables everybody to reach their full potential in contributing to organizational goals, regardless of gender, color, etc. (Thomas, 1991).

According to Bartz, Hillman, Lehrer, and Mayhugh (1990), managing diversity is understanding there are differences among employees, and these differences, if properly managed, will promote the efficiency and effectiveness of the work being done. Differences among employees create a more diversified workforce, with a wide range of perspectives. Managing diversity means embracing the positive aspects of these differences and using them for the betterment of employees and the organization (Bartz, Hillman, Lehrer, & Mayhugh, 1990).

The Glass Ceiling

The continuing entry of women into the workplace has been a major factor influencing the future work environment. The most basic advantage to having a two-gender workforce is that it increases the pool of workers. Unfortunately, despite some improvement, there are large gaps of inequality between women and their male coworkers. Women still do not have the same opportunities as men either to get the good jobs, or to be promoted to supervisory and management positions (Abbasi & Hollman, 1991). For example, Equal Employment Opportunity Commission figures show the percentage of managers who are women grew from 17% in 1978 to 27% in 1988. However, when the focus is narrowed to executive-level positions, the percentage for 1988 drops to 9.2% (Abbasi & Hollman, 1991). Further, according to Ettorre (1993), women made up a mere 3-5% of senior executives in 1992.

The phrase "glass ceiling" is used to encompass a variety of biases that prevent qualified minorities and women from advancing to mid- and senior-level management positions (Morrison, 1992; Zachariasiewicz, 1993). Further, The Department of Labor found the glass ceiling starts at a much lower level than expected (Kalish, 1992). Not only are women concentrated in the lower job ranks, but they are also concentrated in traditionally female occupations - sometimes referred to as "pink-collar jobs" - that pay less than traditional male occupations. They are under-represented in several high paying and fast-growing fields such as engineering (the focus of this study), the natural sciences, and architecture (Abbasi & Hollman, 1991).

Gender Stereotyping

In addition to the glass ceiling, women must battle stereotypes. Baack, Carr-Ruffino, and Pelletier (1993) compared the perception of skills needed by women and men managers, and found that men and women generally agreed on clusters of skills needed to make it to the top. Unfortunately, stereotypes about women managers still prevail (Baack et al., 1993). Heilman, Block, Simon, and Martell (1989) found that stereotypes still exist regarding women's capabilities as high-level managers, and that male characteristics were regarded as necessary to being a successful manager. Further, Basil (as cited in Powell & Butterfield, 1979) discovered that personal attributes rated highly important for individuals in upper management to possess are perceived as more likely to be found in men than women. Powell and Butterfield (1979) conducted a similar study using 684 graduate and undergraduate students. Results found that men and women alike tended to describe a "good manager" in extremely masculine terms.

As a result, professional women often face role-related conflicts due to strong gender role stereotypes and prescriptions for "desirable feminine behavior" which conflict with the desirable managerial behavior. A study of gender role stereotypes

conducted by Broverman, Vogel, Broverman, Clarkson, and Rosencrantz (1972) showed results similar to Powell and Butterfield (1979) in that the attributes ascribed to men were positively valued more often than those ascribed to women. The positively valued traits for men appear to form a cluster of related behaviors that entail competence, rationality, and assertiveness; the positively valued feminine traits form another cluster reflecting warmth and expressiveness. As will be discussed later, the culture of engineering supports the male set of "valued" traits (i.e., assertiveness, etc.), thus perpetuating the male-dominated culture of this traditional field.

Gender stereotypes also spill over into the workplace in that many women and minority employees say they have to prove their competence, while white men typically are assumed to be competent until there is evidence to the contrary (Copeland, 1988). Many complain they have to perform 150% or better than white males in order to advance (Copeland, 1988; Mansfield, Koch, Henderson, Vicary, Cohn, & Young, 1991). Unfortunately, companies may hinder minority employees by denying them the chance to succeed as well as the chance to fail through overprotection and keeping them in training. Furthermore, when women and minority employees do get a chance, others are over-critical, give up on them too soon, and fall back on stereotypes. Both these tendencies - to "protect" minority employees from challenges, and to judge their efforts harshly - stem from the expectation they will not perform as well as others (Copeland, 1988).

Performance Evaluation

Several studies found that women's performance is evaluated less favorably than the same performance by men (Goldberg, 1968; Pheterson, Kiesler, & Goldberg, 1971). According to Lott (1985), there is a tendency to under-rate and under-reward women compared to men with identical credentials. A study conducted by Goldberg (1968) found that two sets of the same articles were judged to be more professionally valuable

and their authors to be more competent when the articles were seen as authored by men rather than women. Subsequent studies have found a consistent bias against women in evaluations. Thus, women are inaccurately perceived, both by male and female respondents, as being less competent than men while handling difficult or important assignments, and as being more responsible for poor performance in non-traditional roles (Larwood, Rand, & Der Hovanessian, 1984). Research also shows that even when women's performance is evaluated positively, it is attributed to external or unstable causes such as luck, effort, or a favorable situation rather than to a stable internal cause like competence (Cash, Gillen, & Burns, 1977; Rosenfield & Stephan, 1978).

Isaacs (1981) examined the conditions under which people are prejudiced against women. Similar to the previous study, articles written by women in a masculine field such as city planning were devalued. However, no bias was found in the way college students judged articles written by men and women when the professional field is one traditionally reserved for women (e.g., teaching, nursing). The most interesting results of Isaacs' study (1981) found that whereas men devalued the work of women in city planning, a masculine field, they did not devalue the identical article once the prestigious title of *Dr.* had been added to the author's name. In fact, there was no anti-female bias in any of the fields once the author had achieved educational status.

Sackett, DuBois, and Noe (1991) studied the differences in performance ratings for males and females across a wide variety of jobs and organizations. They found the performance measures for women are substantially lower than those of men when women make up less than 20% of the group. In fact, women's scores remain lower than men's as long as women make up less than 50% of the group. For those jobs or organizations in which women make up more than 50% of the group, they receive higher average performance ratings than men. Finally, when looking at the population as a whole,

women received ratings only slightly lower than those received by men. It will be interesting to see whether the current study finds that female engineers who have attained a Doctorate or Post-Doctorate degree feel more positive about their performance evaluations than do women without such a degree, or whether the benefit of this "title" is overshadowed by the mere fact women account for less than 20% of the engineering population and as a consequence are more negative about their performance ratings compared to male engineers, regardless of their degree.

Finally, female and minority individuals also seem to receive less positive feedback (e.g., verbal praise, smiling) and more negative feedback (e.g, interruptions; non-verbal signs of dislike) from instructors than do males (James & Levi, in press). This can set up a self-fulfilling prophecy wherein trainers' negative expectations and negative feedback help trigger relatively poor performance, which then reinforces both trainers' and trainees' expectations and behavior patterns.

Organizational Demography

Diversity within an organization (or job function, etc.) parallels a similar concept, "Organizational Demography," which examines the demographic composition of groups. According to Wagner et al. (1984), organizations are fundamentally relational. Therefore, to examine the effect of education, age, or length of service on employee turnover, for example, is to miss the possibility that what may be critical is not an individual's characteristics in isolation, but rather, the relationship of his or her attributes to others in the organization. Therefore, according to Wagner et al. (1984), trying to find a main effect of gender at the individual level of analysis would be misleading. What is important is the person's attributes in relation to the attributes of others in their department, job function, etc. in which he or she works.

Because the literature from the social psychological perspective tells us that similarity is an important basis of interpersonal attraction, it is reasonable to argue that interpersonal attraction is related to integration and, consequently, such organizational factors as turnover, communication, job satisfaction, etc. (Wagner et al., 1984). Because similarity is not an attribute of an individual but rather between two or more persons in an organization, Kanter (1977) and others (e.g., Spangler, Gordon, & Pipkin, 1978) have argued that it is not one's gender or race, per se, but the proportion or composition of a particular group in terms of the characteristics, hence demography.

To determine whether the proportion effect is due to the ratio of males to females, or if it is a function of absolute numbers of males and females in a department, division, etc., Alexander and Thoits (1985) conducted a study to test for effects due to absolute numbers and group size within departments. They found no significant effects for these variables. Proportionality, rather than the absolute numbers of a group, better predicted group member's achievement (Alexander & Thoits, 1985). In light of these findings, the current study will examine the effects of proportion (the ratio of female engineers vs. male engineers in an organization) rather than their absolute numbers.

Effects of Gender in the Workplace

It is important for a new worker in an organization to become acquainted with the technical and social aspects of the job, and to develop a sense of belonging to a peer group. Coworkers often provide newcomers with information regarding the behavioral expectations and norms of the workplace. Yet for a woman entering a male-dominated workplace, integration with colleagues poses special problems.

In a survey of 150,000 working women, Koontz (as cited in Bhatnagar, 1988) found widespread feelings of loneliness and isolation among working women. A study conducted by Yoder (1991) found that women working in non-traditional jobs reported

different degrees of withdrawal, ranging from initial isolation from others to an eventual decision to leave the organization. Bhatnagar (1988) observes however, that the social isolation of women has important implications not only for women, but also for the dominant male group and the entire organization. For example, male reactions to isolation could vary from total indifference to a high degree of concern for female colleagues, and in fact, many men may report having made an effort toward integrating their female coworkers but received a negative response. Likewise, fear of sexual implication could be a deterrent for male initiatives in integrating women in the male groups.

In a study conducted by Cassidy and Warren (1991), it was found that among men and women college graduates, those in gender-consistent occupations (where their own gender represents the majority of the occupation) exhibited significantly higher levels of work satisfaction compared to people in gender-inconsistent occupations (e.g., females in engineering). However, throughout subsequent analyses, employees in occupations in which men predominated reported higher levels of work satisfaction compared to those in the occupations in which women were the majority of workers. These findings held when controlling for other work-satisfaction factors, such as individual earnings, hours worked per week, and length of time employed. Moreover, it was found that men employed in occupations dominated by their own gender were found to have the highest average work satisfaction, followed by women in these occupations (Cassidy & Warren, 1991). Women employed in the occupations dominated by women ranked third in average work satisfaction, while men in these occupations had the lowest average level of work satisfaction.

While these results indicate that holding a gender-consistent position in professional or managerial work was a significant predictor of work satisfaction for white American

college graduates, the effect of gender consistency was mitigated by whether the occupation's workers are predominantly women or men. Men and women in occupations in which men are in the majority had higher levels of work satisfaction than those in women-dominated occupations. This difference remained when controlling for other work-satisfaction factors. Cassidy and Warren's (1991) explanation for this finding is that men's professions are more prestigious and lucrative, while women's professions lack authority and autonomy.

Further, a separate study conducted by Williams (1989), found the cultural value attached to the workers who predominate transfer to the occupation itself. Women entering the more rewarded and powerful male majority occupations may view themselves and be viewed by others as upwardly mobile, thereby enhancing satisfaction with their work. Women engaged in traditional women's work may be less satisfied because their occupations are less valued and less rewarded. Finally, men in these occupations may view themselves and may be viewed by others as downwardly mobile, which could help explain their lower levels of work satisfaction.

Sex-role Spillover

"Sex-Role Spillover" as defined by Gutek and Cohen (1987), is when the sex roles associated with the majority gender become incorporated into the work roles. In male-dominated jobs such as engineering, activity, rationality, and aggressiveness are emphasized, whereas nurturance and passivity are associated with "women's work."

Sex-role spillover affects people in traditional work by having their sex role and work role merged together. Further, it affects people in non-traditional work by the fact that they are a visible minority and their gender does not correspond to the sex roles normally associated with their jobs. Because the gender roles of men and women are very different and have different status and power characteristics in the workplace, each

gender experiences the effects of sex-role spillover in different ways. In the case of sexual behavior at work, the fallout of sex-role spillover is more visibly negative for women than for men (Gutek & Cohen, 1987). While the number of women who work in non-traditional jobs is much higher than the number of men in non-traditional jobs, women continue to face problems of being visible role deviants. Sex-role spillover is not a major problem in integrated jobs because the sex ratios are fairly balanced, hence, neither male nor female sex roles are emphasized.

Power and Gender

The relationship between power and gender in our society is complicated. Studies have shown men tend to have greater access to concrete resources and other sources of external power (Johnson, 1976), and tend to occupy more high status roles than women (Berger, Rosenholtz & Zelditch, 1980; Eagly & Wood, 1982). Because higher status people are assumed to be more competent and influential, women, by virtue of their lower status, are seen as more easily influenced. These differences in status lead to expectations for behavior that are played out and confirmed, thus maintaining expectations and stereotypes.

Most professional women are concentrated in a small number of occupations dominated by women (Cassidy & Warren, 1991). In 1986, women accounted for 94% of registered nurses, 85% of librarians, 73% of non-college teachers, and 65% of social workers. Although men are the minority in these occupations, they do not appear to be disadvantaged by their minority status, perhaps due to the "power" the male gender has in our society as described above. In fact, they tend to progress faster in the occupational hierarchy, be disproportionately located in top-level supervisory or administrative positions, and receive higher salaries (Grimm, 1978).

This gender-based distribution and the status of women and men within these occupations help to reinforce traditional societal views as to who should be found in particular occupations and positions. Men are viewed as gender-consistent in medicine, law, university teaching, science, and upper-level management; women are seen as gender-consistent in nursing, social work, librarianship, grade and high school teaching, and entry-level management (Cassidy & Warren, 1991).

Studies of women working in traditionally male jobs have found problems of segregation (DeFleur, 1985) sexual harassment, sexual discrimination including hostility and sabotage, withholding of training opportunities, and supervisory indifference (O'Farrell & Harlan, 1982). The positive aspects most consistently reported by these women are their earnings, the autonomy and control over their work, and the physical nature of the job (Walshok, as cited in Mansfied et al., 1991). This alleged resistance of incumbent male workers to women in non-traditional jobs is a central issue in job integration, especially in the blue-collar sector where progress is slow (O'Farrell & Harlan, 1982).

O'Farrell and Harlan (1982) found that perceived male coworker hostility significantly reduced the job satisfaction of blue-collar women. Blue-collar women who felt they had been harassed by their male coworkers were less satisfied than other women with every aspect of their work except pay. Not surprisingly, perceived male coworker harassment had its greatest negative impact on the blue-collar women's satisfaction with coworkers, and the second-largest negative impact on satisfaction with supervisors. Satisfaction with work and promotion opportunities was also negatively affected by perceived harassment, but blue-collar women's satisfaction with pay was not affected at all by coworkers' attitudes or actions.

A survey of 265 major corporations shows blue-collar occupations account for only 14% of cases in which women were successfully integrated into non-traditional jobs (Shaeffer & Lynton, 1979). Employers assert that hostile male incumbents discourage women from entering and staying in non-traditional jobs. This assertion supports Lillydahl's findings (1986) in the sense that women who held traditionally male jobs frequently mentioned the importance of male coworker support on the job.

Among blue-collar groups, male expressions of power or resentment against women range from annoying remarks to violence. Although acts of physical violence have not been reported to researchers, cases such as rape have been publicized by the news media and women's groups. Research on this subject suggests men who strenuously oppose working with women are probably in the minority (Meyer & Lee, 1978; O'Farrell & Harlan, 1982). However, it is not uncommon for men to engage in mild forms of harassment such as verbal teasing and practical jokes.

Social isolation (excluding women from lunch groups or refusing to talk to them) is also used by men as a tactic to discourage women from keeping their jobs (O'Farrell & Harlan, 1982). More detrimental, however, is the exclusion of women from formal and informal training where critical information about the job is given to newcomers by supervisors and coworkers. Thus, women may be prevented from adequately performing their job tasks, thereby reinforcing the stereotype that women can't do the non-traditional jobs.

Lillydahl (1986) found the most common grievance expressed by women who have worked in blue-collar male dominated jobs was the resentment they felt from some of their male coworkers, as well as actual harassment on the job. Nonetheless, women who hold or have held traditionally male jobs have positive comments about their experiences, although there were frequent reports of harassment on the job. These women most often

cite high wages as the reason for entering a traditionally male field.

Moreover, the available evidence indicates the majority of women who stay in non-traditional jobs are, in fact, not resented by male coworkers. Schreiber (1979) found that 83% of female and male respondents said their peers were somewhat accepting upon their entry. Women qualified their statements by referring to one or two difficult individuals. Meyer and Lee (1978) found peer harassment was the most frequently mentioned difficulty of the blue-collar women in their sample, but only 27% of the women reported having experienced it. Equal numbers (20%) of the blue-collar women in Meyer and Lee's sample (1978) said men's attitudes towards them were definitely accepting or strongly resentful. Nevertheless, the sizable minority of women who did experience hostility found it intensely disturbing, and it is clear the men's reactions interfered with the women's work.

On the other hand, research indicates that when women do not experience resistance, harassment, etc., the majority of those in traditionally male blue-collar jobs enjoy a relatively high level of job satisfaction (Meyer & Lee, 1978; O'Farrell & Harlan, 1982). Specifically, 75% of the non-traditional blue-collar women in Meyer and Lee's study (1978) liked their jobs very much or fairly well. Likewise, women in non-traditional working class jobs interviewed by Walshok (as cited in O'Farrell & Harlan, 1982) displayed high levels of job satisfaction and described their jobs as complex, interesting, and challenging.

Similar results were found for women in gender atypical jobs in a corporation studied by Schrieber (1979). These women were significantly more satisfied with their work than their counterparts in gender-typical jobs, even when a variety of other factors were held constant. Schrieber (1979) also found that non-traditional workers considered themselves better matched with their jobs, anticipated a clearer job future, and unlike

traditional workers, felt they had emphasized self-perceived skills, abilities, and preferences when choosing a job. Unlike the findings of Cassidy and Warren's (1991) study discussed earlier, the men in gender atypical jobs were significantly more satisfied with their work, despite their working in a "less prestigious" job.

It should not be assumed, however, that all non-traditional work settings for women foster a negative work environment. In a qualitative study of coalminers conducted by Hammond and Mahoney (1983), it was found that for some women coalminers, success means working "like a man" and being expected to "keep up with the men" (p. 21). However, when they work very hard, the women are often surprised to find that the men suggest they slow down, so that the men will not look bad. Nonetheless, women coalminers reported they get a great deal of satisfaction from working with men and being "treated as a person rather than a number" (Hammond & Mahoney, 1983, p. 23). They enjoy interacting with men whether in a flirtatious, seductive, or platonic manner. More importantly, the women recognize the significant role the men play in their informal training; the men's efforts make the women's work less difficult and contribute to a cooperative atmosphere among male and female miners.

Sexual Discrimination and Sexual Harassment

Palmer and Lee (1990) discuss two forms of sexual discrimination. The first, "differential treatment," is defined as treatment discrimination against women as a non-legitimate discrimination of women once they have been hired. This discrimination consists of slower promotion rates, assignment to less attractive or less challenging jobs, lower and/or less frequent raises, and less training opportunities compared to that of their male counterparts. The second type of sexual discrimination is sexual harassment.

Sexual harassment as defined by the Equal Employment Opportunity Commission, is unwelcome sexual advances, requests for sexual favors, and other verbal or physical

conduct of a sexual nature (Woolf, 1992). Faludi (1991) suggests that sexual harassment needs to be seen as part of a large-scale effort against women, in which white men are trying to regain power and go back to the status quo. Woolf (1992) proposes a systems view of sexual harassment, requiring organizations to acknowledge the magnitude of the problem, rather than viewing it as isolated incidents of aberrant behavior. She believes training programs need to be initiated for all levels of employees, including management, to heighten awareness in a non-confrontational manner and to educate employees on new ways men and women can relate to one another (Woolf, 1992).

Mansfield et al. (1991) also found sexual harassment and sex discrimination differences between occupational groups. Significantly more harassment and sex discrimination were experienced by tradeswomen (women in skilled crafts, repair, and construction trades) than clerical workers. In describing their day-to-day jobs, tradeswomen reported significantly more isolation, loneliness, noise, and general undesirability than either the transit workers or secretaries (although the levels were not always high), and more monotony, tension, and fatigue than the secretaries. Further, tradeswomen characterized their supervisors in the most negative terms (e.g., more sexist than either of the other groups, and more disrespectful, unfair, critical, and prejudiced than the secretaries). Their coworkers were reported in very negative terms as well, e.g., lazy, disrespectful, sexist, and prejudiced. In contrast, secretaries described their day-to-day jobs in significantly more positive ways. Their supervisors were significantly more friendly, polite, and supportive, and were more likely to give clear instructions, provide helpful feedback, and be supportive, friendly, caring, and willing to listen compared to the supervisors of tradeswomen.

Gutek and Morasch (1982) discuss two explanations for the occurrence of sexual harassment: the "power differential hypothesis" and "sex-role spillover" in conjunction

with "sex-ratio." The power differential hypothesis argues that sexual harassment results from the difference in power of the sexes in the workplace. However, Gutek and Morash (1982) found that only 45% of the women who reported being sexually harassed were harassed by supervisors. Consequently, Gutek and Morash (1982) suggest that sexual harassment may be due to sex-role spillover and sex-ratio. Sex ratio refers to the percentage of men and women in an occupation and it is this ratio that determines the form of sex-role spillover. Sex-role spillover is defined as the carryover of gender-based roles into the work setting which is exacerbated when there is a highly skewed ratio of the sexes at work (Gutek & Cohen, 1987).

In a study of a government agency conducted by Palmer and Lee (1990), male supervisors reported more favorable attitudes toward female workers than the females' male coworkers. Further, supervisors indicated they would not treat female employees differently than they treat male employees. Male coworkers, on the other hand, reported they do treat their male colleagues more favorably than their female counterparts. While the results of this study would leave one to believe that supervisors are not biased or discriminatory toward female employees, it is possible they may have been more aware of the study's purpose and adjusted their responses accordingly.

In further analyses, Palmer and Lee (1990) performed an ANOVA using past experience working with women and type of worker as the independent variables. A significant main effect for past experience was found, indicating that working with women in the past may improve men's attitudes toward women in the workplace. A study of Coast Guard cadets (Stevens & Gardner, 1987) also found that past work experience may improve male employees' attitudes toward female employees.

The negative effects of nonacceptance in the workplace for women are numerous. A study conducted by Park (as cited in Leiter, Clark, & Durup, 1994) which examined

the experiences of servicewomen in the Canadian Forces found women to report self-imposed pressure to perform to a higher degree than expected of their male counterparts. Similarly, Mansfield et al. (1991) purports that women must not only demonstrate their competence on the basis of their skills but most somehow "overcome" their gender as well. Because these women were in many ways "pioneers" in traditional male roles and environments, Park (as cited in Leiter et al., 1994) reported an increased vulnerability to gender harassment and other forms of nonacceptance such as sexism, paternalism, stereotyping, and varying attitudes about the inappropriateness of their place in these new environments. Similarly, Mansfield et al. found that women who work in traditionally male jobs report significantly more instances of isolation, sexual harassment, and discrimination compared with female clericals (a traditionally female job). Further, Park (as cited in Leiter et al., 1994) reported the effects of these forms of nonacceptance included anger, frustration, resentment, and hostility.

O'Farrell and Harlan (1982) found the link between hostile behavior (harassment of women or "giving them a hard time") and satisfaction was more important in predicting most dimensions of satisfaction than the link between satisfaction and disapproving male attitudes (perceived male coworker disapproval). Coworker disapproval was significantly related only to satisfaction with work, and here too the effect of male resentment was to make the blue-collar women less satisfied.

Mentoring

Although mentorship may be critical for women's success in the workplace in that it provides them invaluable training and a person to look out for their best interests, many theorists contend women face more barriers to obtaining a mentor than men (Hunt & Michael, 1983; Kram, 1983; Noe, 1988; Ragins, 1989). There are at least three reasons for expecting there to be gender differences in perceived barriers to obtaining mentors.

First, women may be reluctant to initiate a relationship with a man for fear the mentor or others in the organization will misinterpret such an approach as a sexual advance (Bowen, 1985; Fit & Newton, 1981; Ragins & Cotton, 1991). Second, traditional gender role expectations which encourage men to take an aggressive role and women a passive role in initiating relationships (Maccoby & Jacklin, as cited in Ragins & Cotton, 1991) may make it difficult for women to initiate cross gender relationships. Women may fear assertive attempts to initiate relationships will threaten potential mentors and may therefore wait for the potential mentors to initiate the relationships. Third, women have fewer formal and informal opportunities than men for developing mentoring relationships. Women lack access to many of the informal settings potential male mentors frequent, such as men's clubs and sports activities. Women also have fewer formal opportunities for mentorship. Specifically, mentors select proteges partially on the basis of their involvement in key visible projects (Hunt & Michael, 1983; Ragins & Cotton, 1991). Since women tend to occupy low-level positions (Ragins & Cotton, 1991), they may be less likely than men to get involved with projects that lead to mentoring relationships.

In summary, the results of Ragins and Cotton's study (1991) indicate women were more likely than men to report restricted access to mentors. Women were also more likely to report mentors were unwilling to enter a relationship with them, that others would disapprove of the relationship, and that either a mentor or others in the organization would misinterpret an approach as a sexual advance. Women and men did not significantly differ on reported fears about initiating a mentoring relationship. A key finding was that women perceived the presence of more barriers than men, even after they controlled for experience as a protégé, age, rank, and tenure. However, in spite of women perceiving greater barriers, they did not differ from men in reported fears about

taking an assertive role in initiating mentoring relationships or in their views about who is responsible for making the first move (Ragins & Cotton, 1991).

Solo Women in Peer Groups

Studies have shown that professional peer groups containing a solo woman face difficult problems (Crocker & McGraw, 1984; Wolman & Frank, 1975). According to Wolman and Frank (1975), a group containing a solo female will incur lowered productivity due to conflict over her role which is assigned through a process of interacting and negotiating. These authors (Wolman & Frank, 1975) describe four basic roles that one can take in a peer group. "Group Leaders" are those to whom other members initiate toward more often than the leader initiates toward them. Overall, the leader upholds group norms, but also can change them. The second role, "Regular Member," describes a member who gives and receives interactions equally, and tends to uphold the group norms. "Deviants" are those who initiate toward others more often than they receive, and tend to break the group norms. By ignoring the deviant, the group punishes the deviant behavior and thereby tends to extinguish it. For awhile, members may reassure a deviant to confirm to group norms, temporarily initiating toward him or her. A member may be intermittently or permanently deviant. Finally, those who play the role of an "Isolate" participate little in group interactions.

Wolman and Frank (1975) led or observed six groups of peers, each including a solo women. In four of the six peer groups, the solo woman occupied a deviant role that made her unhappy; in another group she was an isolate by choice, and in one, a low status regular member. These authors (Wolman & Frank, 1975) reported it was obvious why the women were perceived as deviant when the groups first assembled. In one case, the men immediately attempted to exclude her. When the members started to interact, the woman was not allowed to compete freely for status. The men labeled her assertiveness

as bitchiness or manipulation, and appeared more threatened by competition with her than with each other. Often, they simply ignored assertive behavior from a woman. The four female deviants disliked this role and tried to escape. They became anxious and sometimes quite depressed. In order to earn regular member status, the women tended to increase the number of interactions she initiated toward others, which by definition increased her deviance keeping her locked in that particular role.

Wolman and Frank (1975) make a further observation in that many coping mechanisms carry sex-role labels in our culture. If a woman in their study acted friendly she was thought to be flirting. If she acted weak, the men tried to infantilize her, treating her as a little sister rather than a peer. If she apologized for alienating the group she was seen as a submissive women knowing her place. If she asked for help, she earned a "needy female" label. If she became angry, or tried to point out rationally what the group process was doing to her, she was seen as competitive, in an unfeminine way. In short, "feminine" coping mechanisms increased her perceived differences from the group and so the men isolated her more.

The negative aspects of being a solo female don't seem to apply to solo males (Crocker & McGraw, 1984; Kanter, 1977). The findings of Crocker and McGraw's study (1984) found solo females were unlikely to be group leaders whereas solo males tended to be integrated into the group as leaders at least 30% of the time. Further, overall group satisfaction was lowest when a solo female was present, and gender-related issues were most likely to be raised in groups including a solo female. Further, because women are less likely to be group leaders, this puts them at a distinct disadvantage in solo status situations.

Because promotions and recognitions are largely a function of being identified as a leader, females would seem to be less likely to be promoted when they have solo status,

relative to when they are in a mixed group. Male group members, on the other hand, are equally likely to enjoy leadership roles, regardless of group composition. Similarly, Kanter (1977) also found that when women occupy solo status in a group, many negative consequences arise from that status, whereas for males, this was not the case. Kanter (1977) concludes the competence of men may be distorted in a positive rather than in a negative direction.

An interesting observation of Crocker and McGraw (1984) is that group members were more satisfied with the group composition when the group contained a solo male than when it contained a solo female. This difference in satisfaction was particularly true for the solo females, but only 30% of the solo males indicated a preference for a different group composition. Male targets were perceived to be most masculine when they had solo status, whereas female targets were perceived to be least feminine when they had solo status. Gender was given most often as an explanation for behavior in groups with a solo female and least often in groups with a solo male.

Intentions to Leave an Organization

In a study designed to identify precursors of women's intentions to leave an organization, Rosin and Korabik (1991) found that women who felt their expectations about the job had not been met, who described their jobs as limited in leadership, responsibility, variety, time flexibility, and autonomy, and who cited office politics and being in a male dominated environment as potential factors in a leave decision, expressed low job satisfaction and organizational commitment and had a greater intention to leave. On the other hand, subjects who described their jobs as high on position characteristics, who felt their expectations had been met, and who did not report office politics or being in a male dominated environment, expressed high job satisfaction and organization commitment and were not planning to leave. The results of this study indicate the

importance to women managers of having jobs which afford responsibility, independence, variety, time flexibility, and leadership opportunities. As expected, the more a particular job is perceived to have these characteristics, the higher respondents' satisfaction and organizational commitment and the less likely they are to leave.

Job Burnout

The findings of Leiter et al. (1994) indicate women are more sensitive to the quality of supportive peer relationships than men, while men are more sensitive to the quality of supervisory relationships. Overall, Leiter et al. (1994) found that women in the Canadian military were facing problems with insufficient support systems. Although women and men reported equal frequency of hassles at work, women were more emotionally exhausted and experienced more psychosomatic symptoms. Further, they perceived their work groups as less cohesive and their supervisors less supportive. This perceived lack of support was associated with a greater tendency to resort to avoidance strategies when addressing problems at work. Moreover, their results indicate that personal relationships among peers play a more important role for women and their experience of stress outcomes, than for men (Leiter et al., 1994). In contrast, the relationship of supervisor support with job commitment was distinctly pertinent for men. Although there is a relationship between supervisor support and commitment for women, it is overshadowed by the importance of cohesion.

Tokenism

Kanter (1977) was one of the earlier authors to study the effects of proportions on groups and purported that these proportions are critical in shaping group dynamics. According to this author, there are four group types based on proportions. "Uniform" groups have only one type of person, or one significant social classification (e.g., gender, race/ethnicity, age). Their ratio is 100:0. "Skewed" groups contain a large majority of

one classification, up to a ratio of 85:15. "Tilted" groups begin to move toward a more balanced ratio (65:35), where dominants are the majority but not overwhelmingly so. Finally, there is the "balanced" group with a ratio between 60:40 or 50:50, and where the group's culture and interaction reflect this balance. It is the "skewed" group that Kanter (1977) describes there being "Dominants" and "Tokens." Kanter (1977) further defines tokens as "not merely deviants or people who differ from other group members along any one dimension. They are people identified by ascribed characteristics (e.g., gender, race, religion, ethnic group, age), or other characteristics that carry with them a set of assumptions about culture, status, and behavior highly salient for majority category members" (p. 968).

Kanter's theory of "tokenism" (1977) purports there are three perceptual phenomena of being a proportional rarity. First, tokens, have a higher visibility than dominants in that they draw a larger awareness to themselves. Polarization or exaggeration of differences is the second perceptual tendency according to Kanter (1977). The presence of a person possessing a different set of social characteristics makes members of a numerically dominant group more aware both of their commonalties and with their differences from the token. There is a tendency on the part of dominants to exaggerate the extent of the differences between themselves and the tokens. Assimilation, the third perceptual tendency, involves the use of stereotypes or familiar generalizations about a person's social type. Further the characteristics of a token tend to be distorted to fit the generalization. The result of these three perceptual tendencies, according to Kanter (1977), is that "visibility creates performance pressures on the token. Polarization leads to group boundary heightening and isolation of the token. And assimilation results in the token's role entrapment" (p. 972).

In Kanter's study of a sales force (1977), women reported their technical abilities were overshadowed by their physical appearance, thereby increasing performance pressure. The women had to put in extra effort to make their technical skills known, and to work twice as hard to prove their competence. Both male peers and customers would tend to forget information women provided about their experiences and credentials, while noticing and remembering such secondary attributes as style of dress.

Kanter (1977) purports there are two typical ways tokens respond to performance pressures. First of which is overachieving. Saleswomen put in extra effort, promoted themselves and their work at every opportunity, and let those around them know how well they were doing. Unfortunately, this behavior backfired in that it evoked threats of retaliation on the part of their coworkers. On the gossip circuit, they were known to be doing well but climbing too high too fast. Further, a common prediction was that they would be cut down to size soon.

On the other hand, Zimmer (1988) concludes that a theory such as tokenism is of limited value in explaining the experiences of either men or women in a society where gender remains important. Moreover, this author believes the focus on tokenism may hinder women's progress to the extent that it turns our attention away from an analysis of the effects of sexism in the workplace and the society as a whole. While Zimmer (1988) recognizes that Kanter does not suggest that a balanced workforce alone will eliminate all of women's problems on the job, Kanter does imply that balance is a necessary precondition to women's equal treatment on the job and that any movement toward balance will itself lead to some improvement.

Zimmer (1988) suggests the major limitation of Kanter's approach is its failure to acknowledge the degree to which organizational structures and the interactions that take place within them are imbedded in a much broader social system of inequality between

the genders. She goes on to say that men's negative behavior toward women in the workplace seems to be much less a result of their numerical minority and more a result of men's evaluation of women as a social minority. In short, Zimmer suggests that tokenism is an inadequate explanation for women's occupational difficulties, and that tokenism diverts attention away from the more important issue of sexism. Moreover, in a paper written by Yoder (1991), not only does it point out that Kanter's theory was substantially limited by her failure to acknowledge the extent of organizational and societal sexism, but there is overwhelming evidence that token men avoid the negative consequences of numeric imbalance experienced by women (Yoder, 1991). In fact, the visibility awarded to token men may work to their advantage, enhancing their opportunities for promotion.

Research conducted by Fairhurst and Snavely (1983) support Zimmer's (1988) and Yoder's (1991) opinions. This study of 322 nursing students, 41 of which were male, found token males were not isolated in the way that token females are. These authors believe one possible reason for their results could be due to the male tokens' possession of the gender which is valued more by society giving them a power base from which to resist majority group assertions of control, such as social isolation. For female tokens, in contrast, possessing the less-valued gender only adds to the existing power the males have due to their numerical majority. In short, authors such as Zimmer (1988), Fairhurst and Snavely (1983), and Yoder (1991) suggest that being numerically dominant is only one among many sources of status and control within an organization, and these sources must be considered when examining token dynamics.

Yoder (1991) also discusses intrusiveness theory and how it relates to tokenism. Intrusiveness theory purports the numeric increase of a minority group threaten the majority, who then react with heightened levels of discriminatory behavior in order to

limit the power gains of the growing lower-status minority. Blalock (as cited in Yoder, 1991) hypothesized that the majority's reaction would be harshest when the minority is small. Similarly, Kanter (1977) suggests in her studies that as the group becomes more balanced, the discriminatory behavior will diminish.

Token numbers, low status, and occupational inconsistency may combine to produce the initial token effects as described by Kanter (1977). However, as the lower-status group's numbers increase throughout the occupation, the perceptual processes created by small numbers diminish, and reactions to intrusiveness by the dominant, powerful group are escalated (Blalock, as cited in Yoder, 1991). For the individual in a particular workplace, all these influences plus the gender ratio may combine. If both authors are correct then the initial effects of being a token, or one of a small group of low-status newcomers, are performance pressures, social isolation, and role encapsulation, as well as, for women, sexual harassment and limited opportunities for promotion. Gradually, as the novelty wears off and the minority group increases a bit, the work situation becomes more comfortable. However, when numbers of a low-status group increase substantially across the occupation, the reaction is stepped-up harassment, blocked mobility and lower wages (Blalock, as cited in Yoder, 1991).

A study conducted by Alexander and Thoits (1985) examined effects of proportion on students' GPAs. Findings support Kanter's theory in that there is a proportion effect evident in skewed and tilted groups. Contrary to expectation, however, when a significant proportion effect was present, both female tokens among males and male tokens among females appear to overachieve with respect to the dominant group, rather than underachieve. However, Alexander and Thoits (1985) retested for a proportion effect by comparing the performance of women tokens to that of women who were not tokens, and by comparing the performance of men tokens to that of men who were not

tokens. These results clearly indicate that tokenism actually decreases the achievement of females. Women in male dominated departments earn significantly lower grades than women in balanced departments, and in female-dominated departments, women perform as well as "balanced" women. In contrast, the results for males indicate tokenism has no effect on achievement. The grades of men in female-dominated groups do not differ significantly from the grades of men in balanced departments. In short, Alexander and Thoits (1985) conclude intra-gender comparisons across departments, locations, etc. reveal a proportion effect which is not visible when comparing men and women within one situation.

To summarize the findings of this study, Alexander and Thoits (1985) found that when dominants are used as the comparison group for determining token achievement, tokens appear to perform at equal or greater levels. However, when tokens are compared to members of their own social category in balanced departments, token women underachieve while token men tend to perform equally. Alexander and Thoits (1985) also concluded that because their results found that token men did not underachieve relative to non-token men, they would not generalize Kanter's theory to all tokens, rather to only low-status tokens (females) among high-status dominants (males).

A social systems logic that supports the theory of tokenism, according to Laws (1975), is referred to as meritocracy. Belief in meritocracy requires that token and majority individuals believe membership of a group is achieved, not assigned, and that a group's high standards justify its exclusivity. According to Turner (as cited in Tsui, Egan, & O'Reilly, 1992), a necessary element to the theory of tokenism is a "psychological group." According to this author, a psychological group is a collection of people who share the same social identification or define themselves in terms of the same social category. An important characteristic of a psychological group is that individuals

can identify with it and derive self-identity without necessarily engaging in interpersonal interaction with all or any members of that group. Based on this definition, a variety of social categories in the work context, including organizational and demographic attributes, may be used for self-categorization. If an individual uses gender as a category for self-identification, satisfaction with the organization as a psychological group will be highest when the organization comprises members of the particular gender category chosen. According to Tsui et al. (1992), self-categorization theory assumes people prefer to be with similar others; being unique may be less desirable than being one of the group. In short, this theory purports that because homogeneity is preferred over heterogeneity, an individual's satisfaction with a group will be reduced when the actual composition of the group becomes less homogeneous.

Women in Engineering

According to Robinson and McIlwee (1989), "engineering holds the curious distinction as being both the most male-dominated of the professions and one in which women have increased their numbers most dramatically" (p. 455). Nevertheless, women today remain disproportionately under-represented in this field (Morgan, 1992). Even fields closely related to engineering are less male-dominated. For example, in 1984 women constituted 26% of computer specialists, 22% of mathematical scientists, and 11% of physical scientists, but only 3% of engineers (National Science Foundation, 1986, as cited in Robinson & McIlwee, 1989). Yet during the 1970s and early 1980s, the percentage of women receiving engineering degrees grew dramatically. Women accounted for less than 1% of all bachelor's degrees awarded in engineering in 1970 (Vetter, 1981). By 1986, however, women accounted for 14% of engineering degrees earned, a larger percentage increase than in any other science-related field (American Association of Engineering Societies 1987, as cited in Robinson & McIlwee, 1989).

The vast majority of studies of engineers have generally involved students rather than engineers in the field (Jagacinski, 1987). Today's woman engineering student is less likely to find that she is the only woman in her classes than was the woman engineering student 15 years ago. Nonetheless, the ratio of men to women in the field of engineering is still very high and the presence of just two or three women engineers in a given department might lead to different experiences for women than men.

A study conducted in the field by Robinson and McIlwee (1989) investigated how women truly faired in engineering. In 1989, engineering was one of the few rapidly growing professional fields, and offered the highest starting salaries for bachelor's degree recipients. According to the College Placement Council (as cited in Robinson and McIlwee, 1989), women received starting salaries equal to and even slightly greater than men. Moreover, engineering offered considerable mobility into management positions (Perucci, 1970).

Despite these encouraging facts, Robinson and McIlwee (1989) found differences in job status between males and females who received the same education and had been out of school only a few years. Forty-two percent of the women, but only 23% of the men occupied positions below the level of design. (Design/Research and Development were cited by respondents to be the most admired engineering positions among engineers, and 52% of respondents thought it was most valued by management.) Nearly 58% of the men worked in the strategic area of design, compared to only 43% of the women. Nearly 20% of the men, but only 15% of the women had risen into supervisory positions.

Similarly, a study conducted in 1981 called the National Engineering Career Development Study (as cited in Jagacinski, 1987), found that male engineers reported higher levels of supervisory responsibility on their first jobs than did women. For present jobs, men and women did not differ in technical responsibility, but men reported greater

supervisory responsibility and salary than women. Particularly in the case of salary, the gap between men and women increased with experience, other studies have found this to be true as well (Jagacinski, 1987; Vetter, 1981). Men were also more satisfied with the career advancement opportunities provided by their jobs, and women felt there were better opportunities for men than women in engineering. In conclusion, it appears women engineers are not receiving the same career advancement opportunities as men. While the industry has become more willing to hire women engineers, they are not promoted to the same supervisory levels as men (Jagacinski, 1987).

By 1986, the number of degrees earned by women in science and engineering began to fall (Lane, 1990), and recent data from college-bound women indicate they do not plan to major or have careers in engineering and in the physical sciences in the same proportions as college-bound men (Morgan, 1992). Brush (1991) says there is no simple explanation as to what is preventing more women from going into science and engineering. In the past two decades overt discrimination may have become more subtle, but it is still effective.

"One lesson of the past 20 years is that efforts to recruit women into technical programs and to eliminate obstacles within the education system, while obviously necessary, are not sufficient" (Brush, 1991, p.404). During college and graduate school, women students who are apparently well qualified and motivated, lose their self-esteem, are harassed by male professors and students, are excluded from crucial discussions and social interactions, and in general, are made to feel they do not belong (Brush, 1991). A study conducted by Morgan (1992) surveyed 283 men and women at three universities. The reason most often cited for a low participation rate in engineering by women was that men resent women colleagues, followed closely with the concern that women have difficulty combining family and career. The discouragement by parents and others from

studying engineering was the third most often given barrier, and fourth, that women cannot work part-time in engineering.

Robinson and McIlwee (1991) have developed a concept they refer to as the "culture of engineering" which explains why and how men fare better than women in the field (p.403). The concept describes the workplace as a gathering of power relationships in which individuals and groups pursue and maintain occupational cultures that dictate how men and women lead their careers and that engineering, in addition to being dominated by men, puts women at a disadvantage. Further, the culture of engineering, according to these authors, comprises more than just the importance of technology and organizational power. It also values behaviors consistent with the male gender role. Specifically, engineering competence is a function of how well one presents an image of an aggressive, competitive, technically-oriented person. To be taken as an engineer is to look like an engineer, talk like an engineer, and act like an engineer. In most workplaces, according to the authors, this means looking, talking, and acting male.

Robinson and McIlwee (1991) also write that women are most disadvantaged in their career growth in organizations where the culture of engineering dominates. Where engineers as a group are powerful, workplace culture takes on a form strongly identified with the male gender role, emphasizing aggressive displays of technical competence as the criteria for success. It thus devalues the gender attributes of women and equates professional competence with "masculinity." Conversely, in organizations where engineers have less power, the workplace culture less closely reflects their interests, to women's benefit. In short, women's chances for success improve as competence is less male-defined (Robinson & McIlwee, 1991).

According to Braddock (as cited in James & Levi, in press), hiring, assignment, training, and promotion biases are reasons often cited for why women and minorities are

under represented in technological positions. Substantial evidence (James & Khoo; Nivea & Gutek, as cited in James & Levi, in press) exists of discrimination in each of these areas, although only some of it directly examines discrimination in technology-related positions. Small percentages of minorities or women, in either an organization or a profession, create higher levels of anxiety about their own performance because of the high levels of scrutiny they are under (Kanter, 1977). According to Mullen and Baumeister (as cited in James & Levi, 1993) this typically inhibits effectiveness. In addition, if women or minority individuals have internalized negative stereotypes about their aptitude with technology, this may help activate these stereotypes and attitudes and make technological success less likely.

Current Study

The initial findings of Rosabeth Moss Kanter (1977), as well as the findings of other studies discussed throughout this paper, present a substantial amount of information regarding women and minorities working in male/non-minority dominated environments. Research has also been presented on women in the field of engineering. However, much of this research has involved students rather than engineers in the workplace. For these reasons, in addition to a study conducted by Stangor, Lynch, Duan, and Glass (1992) which found that subjects were more likely to categorize others according to their gender rather than their race, the current study investigates the experiences of female engineers in an actual work setting.

Hypotheses. Nine hypotheses are examined in the present study. Each hypothesis probes various aspects of work environment topics or categories: supervision, involvement and participation, diversity, performance appraisal, training and career development, pay and recognition, job satisfaction, communication, and working relationships. In general, it is expected female engineers (tokens) will be significantly

less satisfied than male engineers (dominants) and female secretaries (non-token females) on each work environment topic examined.

Hypothesis 1: Female engineers will have significantly lower levels of satisfaction with their supervisor than male engineers and non-token females. Responses on several survey questions relating to supervision will indicate female engineers will be more likely to report their supervisor shows favoritism, and that their supervisor is less receptive and responsive. Further, female engineers will report their supervisor provides less feedback, does not do a good job of building teamwork, and that he or she doesn't work well with people who are different from him or herself.

Hypothesis 2: Female engineers will report significantly less opportunities for involvement and participation than their male counterparts and non-token females. This work environment category consists of five survey questions. Responses to these questions will reveal female engineers will feel there are less opportunities for input regarding their job, feel their contributions are not considered important in the company, and feel less involved in the planning of their work and solving problems related to their work.

Hypothesis 3: Women engineers will rate the work environment as significantly less accepting of diversity than non-token females or male engineers. Responses to several survey questions are expected to indicate female engineers will be less likely to believe management supports equal opportunity, and will rate the working environment less favorably on its acceptance of differences in race/ethnicity, gender, age, disability, sexual orientation, etc. They will also feel the company's diversity program is making less progress compared to male engineers and non-token females.

Hypothesis 4: Male engineers and non-token females will be significantly more satisfied with the performance appraisal process than female engineers. Responses to

survey questions will reveal male engineers are more likely to report their job is evaluated fairly and be more likely to understand how their performance is evaluated. Male engineers will also rate the performance review process more positively in its usefulness for identifying strengths and weaknesses, improving job performance, and helping them in their career development and planning.

Hypothesis 5: Women engineers will report significantly less opportunities for training and career development than male engineers and non-token females. Responses to eight survey items examined in this category are expected to show female engineers will report less opportunities for learning about job openings, and will be less inclined to believe the company promotes the best-equipped and skilled people. They will be less satisfied with the career coaching they receive. Female engineers will also be less likely to believe the criteria for advancing in one's career within the company are applied to everyone in a consistent manner and that movement outside the job posting system is fair. Finally they will be less satisfied with the training they receive to improve their skills in their current job or increase their eligibility for another job.

Hypothesis 6: Female engineers will be significantly less satisfied than male engineers and non-token females with the recognition and pay they receive as evidenced by the results for several survey questions. Female engineers will be more likely to report their supervisor seldom gives them recognition for work done. Additionally, they will not feel they are paid fairly compared with other people in their department people in other departments in their job classification, or others throughout the company who perform the same or similar work.

Hypothesis 7: Male engineers and non-token females will report significantly higher levels of overall job satisfaction compared with female engineers. Specifically, male engineers' and non-token females' responses to a number of survey questions will

indicate they are more likely to recommend the company as a good place to work, and report higher levels of satisfaction with their department's morale, and the people they work with. They will also be more satisfied with their opportunities to input ideas, use their abilities and skills, and report their work provides them a sense of personal accomplishment.

Hypothesis 8: Female engineers will feel significantly less comfortable communicating thoughts and opinions than male engineers and non-token females. Results for three survey questions regarding this topic will indicate female engineers do not feel as safe speaking up in the company compared to their male counterparts, and feel little effort is make to get the opinions and thinking of people in the company. Finally, female engineers will feel less comfortable going to someone higher in authority if they were dissatisfied with their manager's decision on an important matter.

Hypothesis 9: Male engineers and non-token females will rate five working relationships significantly questions more positively than female engineers. Specifically, they will be more likely to report the people they work with usually get along well together, that people are treated with respect regardless of their job, and that relations between people of different races or ethnic backgrounds are usually good. Male engineers and non-token females will also report the people they work with are more willing to help each other, even if it means doing something outside their usual activities. For a list of questions used for analyzing each hypothesis, please see Appendix A.

Method

Participants

While most studies of women in engineering have used students for subjects, the current study examines the effects of tokenism and working in a male-dominated environment on female engineers in an actual work setting. A census of 9,037 employees

and managers in a world-class high technology research and development organization were asked to respond to a biannual employee opinion survey. Completed questionnaires were returned by 5,443 employees (60% return rate). Of the survey respondents, 1,715 were female, 3,533 were male, and 195 respondents did not identify their gender and, therefore, were eliminated from the analysis. Engineers accounted for 2,652 of the respondents, 14% were women, 86% were men. The non-token female group under examination consisted of 61 Executive Secretaries and Staff Secretaries. One hundred percent of the survey respondents in this job category were female.

Instrument

Items analyzed in the current study are a subset of the organization's employee opinion survey designed by an external consulting firm, International Survey Research (ISR). This "1996 Employee Opinion Survey" was the third survey ISR has conducted for the company. The instrument contains 201 items addressing the following topics: work organization, business operations, quality, management, supervision, working relationships, involvement/participation/empowerment, diversity, communication, performance management, training and career development, rewards and recognition, benefits, job security, personnel policies and procedures, job satisfaction, image, mission/vision/values, organization change, customer focus, and reaction to the survey.

Items are randomized throughout the questionnaire to prevent response sets (e.g., patterns, acquiescence, etc.). To prevent acquiescence response bias, the instrument included positively-worded items as well as several negatively-worded items. To ensure consistency in respondents' interpretation of the items, a Definitions Section was also included in the survey which defined key terms (e.g, Company Management, Division Management, Supervisor, Customer) used throughout the survey. In addition, the survey

included one open-ended qualitative question allowing respondents to write any ideas or suggestions they would like to bring to the attention of management.

Respondents were asked to code themselves under eight demographic variables: Business Unit, Job Classification (e.g., administrative, engineer, management), Work Location, Gender, Ethnic/Racial Background, Level of Education, Length of Service, and Age. To increase respondents' confidence in their anonymity, it was clearly written in the survey that no results for groups of less than 20 respondents would be reported.

As part of the survey design phase, the instrument was pre-tested during an on-site pilot with 30 employees in the company representing all divisions, job levels, tenure, etc. The purpose of the pre-test was to ensure the instructions for filling out the survey were easy to understand, the demographic variables were accurate and complete, the definitions were appropriate to the culture and terminology of the organization, and that all items were worded appropriately and easy to interpret. The finalized survey instrument is included in Appendix B.

Procedure

The survey was conducted between January and March, 1996. Most employees were familiar with the survey process as this was the third iteration of the Employee Opinion Survey. Each employee received the survey via inter-office mail and were asked to return their completed survey within four weeks. Employees were reminded that participation was voluntary. To ensure anonymity, each survey was accompanied with a postage paid business return envelope respondents used to mail the survey directly to ISR for processing.

Results

Reliability

To examine each hypothesis, survey items were grouped into the following theoretical concepts of work environment topics or categories: supervision, involvement and participation, diversity, performance appraisal, training and career development, pay and recognition, job satisfaction, communication, and working relationships. For each theoretical category, Chronbach's alpha was computed to examine inter-item reliability and consistency. Seven out of the nine categories (Supervision, Involvement and Participation, Diversity, Performance Appraisal, Training and Career Development, Pay and Recognition, Job Satisfaction) have alpha values between .8212 and .9555 (see Table 1). Further, the majority of items within their respective categories have high corrected item-total correlations. Thus, while the items within each category are measuring different aspects the category topic, they are in fact measuring the same topic. Because the remaining two categories (communication and working relationships) have low alphas (-.19 and -.37, respectively), the items are analyzed individually rather than categorically. Please refer to Table 1 for correlations, corrected item total correlations (in italics), category alphas, and overall item means and standard deviations.

To examine each hypothesis (i.e., to determine whether mean survey scores for female engineers are significantly less favorable on the previously noted work environment factors compared with the mean scores for (a) male engineers and (b) non-token females), planned comparisons were performed. Despite the proposed directional hypotheses, the more conservative two-tailed significance tests were used. The results of the planned comparisons are provided in Tables 3-11 under the respective hypothesis.

Descriptive Statistics

Item means and standard deviations for each group are provided in Table 2. In general, item means for male engineers were significantly higher (more favorable) than item means for female engineers, for the majority of survey questions in several categories, namely: Involvement and Participation, Diversity, Job Satisfaction, and Working Relationships. Further, the majority of item means for non-token females are significantly higher than the item means for female engineers in several categories as well: Supervision, Diversity, Performance Appraisal, Training and Development, and Job Satisfaction. Moreover, for many items, the mean scores for non-token females were not only higher than the mean scores for female engineers, but they were often higher than the means for male engineers as well. Interestingly, this was not the case for question 97c in the Diversity category. This question asked if the company's working environment was accepting of differences in gender. The mean score for male engineers on this item was 3.33 while the mean scores for female engineers and non-token females were 2.92 and 3.22, respectively.

Contrary to expectation, there were two survey items where the mean score for male engineers was significantly lower than the mean score for female engineers. Female engineers ($\underline{M}$ = 2.85) were significantly more satisfied than their male counterparts ($\underline{M}$ = 2.68) when rating their last performance review on helping them in their career development and planning. Similarly, the mean score for female engineers ($\underline{M}$ = 2.81) was significantly higher than the score for male engineers ($\underline{M}$ = 2.67) when asked how satisfied they were with their advancement opportunities. Please refer to Table 2 for a complete list of item means and standard deviations for each group.

Table 1

Category Inter-item Correlations, Item Total Correlations (in italics) and Overall Item Means and Standard Deviations

Supervision (.96)

	Q3	Q18	Q30	Q80A	Q80B	Q89B	Q89C	Q89D	Q89E	Q89F	M	SD
Q3	.86		--	--	--	--	--	--	--	--	3.17	1.05
Q18	.68	.73	--	--	--	--	--	--	--	--	2.95	1.11
Q30	.75	.63	.80	--	--	--	--	--	--	--	3.68	.65
Q80A	.72	.63	.73	.81	--	--	--	--	--	--	3.38	.91
Q80B	.77	.64	.71	.83	.85	--	--	--	--	--	3.19	.98
Q89B	.64	.55	.60	.61	.64	.73	--	--	--	--	3.20	.93
Q89C	.84	.69	.77	.74	.78	.71	.89	--	--	--	3.16	1.08
Q89D	.74	.60	.67	.67	.73	.65	.76	.83	--	--	3.18	1.02
Q89E	.72	.59	.65	.66	.71	.64	.75	.85	.82	--	3.14	1.02
Q89F	.71	.62	.66	.65	.68	.62	.76	.70	.71	.80	3.13	1.00

Involvement and Participation (.82)

	Q5	Q67	Q74	Q83A	Q83B	M	SD
Q5	.62		--	--	--	2.80	.97
Q67	.42	.47	--	--	--	2.95	.86
Q74	.46	.36	.55	--	--	3.04	.83
Q83A	.51	.36	.43	.69	--	2.84	1.01
Q83B	.54	.40	.49	.79	.75	3.06	.92

Diversity (.87)

	Q26	Q64	Q97A	Q97B	Q97C	Q97D	Q97E	Q97F	Q97G	Q97H	Q97I	Q106E	M	SD
Q26	.52	--	--	--		--	--	--	--	--	--	--	2.84	.97
Q64	.44	.34	--	--		--	--	--	--	--	--	--	2.43	.99
Q97A	.39	.31	.62	--		--	--	--	--	--	--	--	3.01	.87
Q97B	.52	.31	.57	.83		--	--	--	--	--	--	--	3.27	.77
Q97C	.50	.31	.58	.85	.82	--	--	--	--	--	--	--	3.23	.79
Q97D	.47	.30	.55	.75	.75	.83	--	--	--	--	--	--	3.34	.74
Q97E	.43	.28	.54	.70	.73	.76	.79	--	--	--	--	--	3.22	.79
Q97F	.46	.27	.57	.76	.73	.76	.73	.83	--	--	--	--	3.33	.69
Q97G	.43	.29	.54	.71	.71	.78	.73	.77	.81	--	--	--	3.35	.72
Q97H	.43	.28	.57	.71	.69	.66	.68	.73	.66	.76	--	--	3.15	.84
Q97I	.42	.25	.54	.68	.70	.77	.75	.76	.78	.69	.80	--	3.36	.74
Q106E	-.50	-.38	-.46	-.45	-.45	-.43	-.41	-.41	-.40	-.43	-.40	-.56	2.42	1.05

Performance Appraisal (.90)

	Q22	Q70	Q102A	Q102B	Q102C	M	SD
Q22	.66	.	--	--	--	2.87	.92
Q70	.64	.64	--	--	--	2.73	.94
Q102A	.56	.54	.83	--	--	3.32	1.18
Q102B	.58	.56	.88	.87	--	3.16	1.18
Q102C	.54	.64	.74	.81	.78	2.88	1.26

Training (.87)

	Q8	Q23	Q49	Q52	Q56	Q75	Q82A	Q82B	M	SD
Q8	.59	--	--	--		--	--	--	2.61	.99
Q23	.45	.63	--	--		--	--	--	1.86	.87
Q49	.42	.49	.64	--		--	--	--	2.03	.96
Q52	.41	.46	.51	.62		--	--	--	2.39	1.04
Q56	.41	.58	.53	.50	.65	--	--	--	1.77	.85
Q75	.53	.51	.43	.44	.55	.62	--	--	2.15	.95
Q82A	.43	.38	.44	.42	.35	.35	.62	--	2.92	.97
Q82B	.44	.41	.49	.47	.41	.42	.77	.67	2.53	1.05

Pay and Recognitions (.84)

	Q37	Q84B	Q84C	Q84D	M	SD
Q37	.31	--	--	--	2.81	0.95
Q84B	.30	.78	--	--	2.67	1.00
Q84C	.30	.80	.84	--	2.59	1.00
Q84D	.27	.78	.89	.81	2.47	1.02

Job Satisfaction (.86)

	Q13	Q27	Q40	Q61	Q105E	Q105F	Q105G	Q105H	Q105I	M	SD
Q13	.58	--	--	--	--	--	--	--	--	3.09	.85
Q27	.40	.53	--	--	--	--	--	--	--	3.24	.81
Q40	.49	.39	.60	--	--	--	--	--	--	2.63	.93
Q61	.32	.51	.31	.50	--	--	--	--	--	3.18	.83
Q105E	.42	.32	.36	.32	.57	--	--	--	--	2.70	1.12
Q105F	.43	.43	.48	.42	.47	.72	--	--	--	3.68	1.06
Q105G	.42	.33	.42	.32	.55	.62	.67	--	--	3.17	1.16
Q105H	.25	.30	.38	.28	.22	.38	.34	.47	--	4.19	.87
Q105I	.47	.38	.49	.36	.45	.63	.60	.51	.72	3.86	1.11

Communication

	M	SD
Q6	2.80	.95
Q21	2.62	.98
Q34	2.09	.83

Working Relationships

	M	SD
Q4	3.45	.77
Q19	2.74	.98
Q32	2.21	.49
Q43	3.35	0.81
Q106D	2.42	1.07

Table 2

Means and Standard Deviations for Female Engineers (FE), Male Engineers (ME), and Non-token Females (NTF) on Survey Items

Supervision Survey Items	FE		ME		NTF	
Item	M	SD	M	SD	M	SD
3 Supervisor does a good job of building teamwork	2.86	.91	2.96	.90	3.50***	.76
18 Supervisor shows favoritism to some people	2.66	.99	2.85**	.97	3.33***	.82
30 Supervisor works well with people different from him or her (e.g., gender, racial/ethnic background)	3.62	.64	3.75**	.56	3.93**	.35
80 Regarding suggestions for change, supervisor is:						
a Receptive	3.28	.77	3.30	.75	3.47	.65
b Responsive	3.06	.86	3.02	.85	3.40**	.62
89 Supervisor:						
b Is available when needed	3.00	.86	3.09	.79	3.52***	.68
c Manages people well	2.88	.93	3.00*	.92	3.53***	.65
d Works with employees to establish goals	2.95	.90	2.94	.91	3.25*	.94
e Gives adequate feedback on performance	2.82	.98	2.87	.94	3.33***	.96
f Maintains effective discipline	2.86	.90	3.09***	.78	3.37***	.82

* p<.05 **p<.01 ***p<.001

Note. Asterisks indicate a statistically significant difference, using a t-statistic, between FE and ME and FE and NTF.

Item	FE M	FE SD	ME M	ME SD	NTF M	NTF SD
Involvement and Participation Survey Items						
5 Opportunity for input before changes are made	2.67	.89	2.88***	.92	3.28***	.86
67 Contributions are considered important	2.79	.80	2.97**	.84	3.27***	.67
74 Differing opinions are openly discussed	3.07	.83	3.19**	.73	3.02	.88
83 Supervisor involves employee in:						
a Planning the work of department	2.84	.99	2.93	.96	3.08	.90
b Solving problems related to the work	3.08	.88	3.15	.82	3.26	.78
Diversity Survey Items						
26 Management supports equal opportunity	2.76	.86	2.94**	.91	3.11**	.74
64 The Diversity Program is making real progress	2.19	.93	2.16	.97	3.06*	.73
97 Working environment accepting of differences in:						
a Job function	2.76	.84	3.06***	.73	3.26***	.52
b Race/ethnicity	3.18	.68	3.35***	.66	3.34	.58
c Gender	2.92	.84	3.33***	.68	3.22*	.70
d Religion	3.29	.67	3.46***	.62	3.37	.59
e Age	3.09	.73	3.19*	.75	3.31*	.60
f Disability	3.29	.62	3.40**	.59	3.31	.60
g Veteran status	3.39	.59	3.46	.62	3.42	.50
h Sexual orientation	2.84	.97	3.18***	.84	3.34**	.68
i Marital status	3.21	.70	3.45***	.62	3.39	.63
106 XYZ's success in putting the following value into practice: e. RESPECT FOR THE INDIVIDUAL: Trust and empowerment; individuality, diversity; individual sensitivity; focus on accomplishments	2.52	.99	2.43	1.03	2.30	1.01

* p<.05 **p<.01 ***p<.001

Note. Asterisks indicate a statistically significant difference, using a t-statistic, between FE and ME and FE and NTF.

Item	FE M	FE SD	ME M	ME SD	NTF M	NTF SD
Performance Appraisal Process Survey Items						
22 Think performance on the job is evaluated fairly	2.89	.82	2.85	.88	3.48***	.57
70 Understand how performance is evaluated	2.55	.89	2.61	.93	3.16***	.80
102 Rate last performance review on:						
a Identifying strengths and weaknesses	3.18	1.14	3.11	1.12	3.89***	.99
b Improving job performance	3.04	1.13	2.91	1.10	3.91***	.96
c Helping career development and planning	2.85	1.19	2.68**	1.16	3.53***	1.18
Training and Development Survey Items						
8 Adequate opportunity to learn about available jobs	2.83	.90	2.83	.86	3.25**	.60
23 XYZ does a good job of promoting the best-equiped and skilled people to be mgrs/supervisors	1.86	.79	1.96	.83	2.45***	.84
49 Satisfied with the career coaching received	2.17	.94	2.08	.89	2.66**	.89
52 XYZ offers long-term career opportunities	2.61	.99	2.54	1.00	3.15***	.74
56 Criteria for advancing in career are applied to everyone in a consistent manner	1.77	.77	1.82	.80	2.46***	.93
75 Movement outside the job posting system is fair	2.34	.91	2.40	.91	2.60	.77
82 Sufficient opportunities to receive:						
a Training to improve skills in current job	3.03	.88	3.02	.83	3.56***	.68
b Training to increase eligibility for another job	2.61	1.00	2.63	.96	3.38***	.86

* p<.05 **p<.01 ***p<.001

Note. Asterisks indicate a statistically significant difference, using a t-statistic, between FE and ME and FE and NTF.

Item	FE M	FE SD	ME M	ME SD	NTF M	NTF SD
Pay and Recognition Survey Items						
37 Supervisor seldom gives recognition	2.81	.85	2.83	.91	3.21**	.91
84 Fairly paid compared with:						
b Other people in department	2.74	.96	2.77	.92	2.78	.99
c People in other departments in job classification	2.51	.96	2.53	.96	2.74	.89
d Others throughout XYZ who perform similar work	2.50	.98	2.47	.98	2.77	.87
Job Satisfaction Survey Items						
13 Would recommend XYZ as a good place to work	3.04	.77	3.01	.86	3.58***	.53
27 Work gives sense of personal accomplishment	3.14	.80	3.22	.78	3.47**	.70
40 Morale in department is generally high	2.50	.90	2.62*	.91	3.04***	.81
61 Job offers little opportunity to use abilities/skills	3.21	.78	3.27	.79	3.31	.85
105 Satisfaction with following aspects of job:						
e Advancement opportunities	2.81	1.08	2.67*	1.05	3.30**	1.07
f The opportunity to input ideas	3.56	1.05	3.75**	.99	3.98**	.96
g Recognition for performance	3.10	1.07	3.13	1.09	3.60**	1.20
h The people one works with	4.11	.97	4.25**	.77	4.31	.89
i Being treated with respect and fairness	3.69	1.14	3.90***	1.01	4.23***	.96
Communication Survey Items						
6 Most of the time it is safe to speak up at XYZ	2.77	.85	2.84	.90	2.89	.74
21 If dissatisfied with supervisor's decision would feel free to go to someone higher in authority	2.54	.92	2.60	.96	2.69	.91
34 Little effort made to get opinions of employees	2.09	.72	2.02	.74	1.75**	.44

* p<.05 **p<.01 ***p<.001

Note. Asterisks indicate a statistically significant difference, using a t-statistic, between FE and ME and FE and NTF.

Working Relationships Survey Items

	FE		ME		NTF	
Item	M	SD	M	SD	M	SD
4 People usually get along well together	3.28	.76	3.43***	.63	3.56**	.56
19 People are treated with respect regardless of job	2.51	.87	2.75***	.82	2.74	.86
32 Relations between races/ethnic backgrounds good	2.21	.45	2.10**	.35	2.08	.28
43 People willing to help each other	3.24	.76	3.30	.64	3.21	.65
106 XYZ's success in putting the following value into practice: d. TEAMWORK: Shared values and focus; teamwork, internal and external; mutual benefits, mutual respect	2.66	1.01	2.58	.98	2.13***	.90

* p<.05 **p<.01 ***p<.001

Note. Asterisks indicate a statistically significant difference, using a t-statistic, between FE and ME and FE and NTF.

Hypothesis 1: Supervision

It was hypothesized that female engineers would have significantly lower levels of satisfaction with their supervisor than male engineers and non-token females. As noted in Table 3, female engineers (FE) did not differ significantly from male engineers (ME) on supervision $t(740) = 1.51$. On the other hand, non-token females (NTF) had significantly higher satisfaction than female engineers in this area $t(740) = 3.36$. Because results from a test for homogeneity of variance found the assumption of equal variance had been violated for the female engineer/non-token female contrast, individual t-tests were run to further analyze the data. Results of the t-tests confirmed non-token females were significantly more satisfied than female engineers on 90% of the items in this category. Therefore, the planned comparison results for this contrast are reported. In summary, Hypothesis 1 is partially supported. While no significant differences were found between male and female engineers, significant differences were found between female engineers and non-token females.

Hypothesis 2: Involvement and Participation

It was anticipated female engineers would report significantly less opportunities for involvement and participation than their male counterparts and non-token females. Results support Hypothesis 2. Female engineers were significantly less favorable than male engineers $t(1710) = 3.60$ and non-token females $t(1710) = 3.02$ with regard to their opportunities for involvement and participation (see Table 4).

Hypothesis 3: Diversity

It was proposed women engineers would rate the work environment as significantly less accepting of diversity than non-token females or male engineers. Table 5 shows that female engineers were significantly less favorable than both male engineers $t(538) = 4.48$

and non-token females $t(538) = 2.70$ in the Diversity category. Hypothesis 3 is supported.

Hypothesis 4: Performance Appraisal Process

It was hypothesized that male engineers and non-token females would be significantly more satisfied with the performance appraisal process than female engineers. However, the results indicated that female engineers did not significantly differ from male engineers in the Performance Appraisal category $t(1867) = .96$ (please refer to Table 6). On the other hand, a significant difference was found between female engineers and non-token females $t(1867) = 5.53$, however, because a test for homogeneity of variance found the assumption of equal variance had been violated for this contrast, individual t-tests were run. Results of the t-tests confirmed the results of the planned comparison. Non-token females were significantly more satisfied than female engineers on every item in the Performance Appraisal category. Therefore, the results of the planned comparison were confirmed. In summary, Hypothesis 4 is partially supported. While no significant differences were found between male and female engineers regarding performance appraisal, significant differences were found between female engineers and non-token females in this category.

Hypothesis 5: Training and Career Development

It was expected women engineers would report significantly less opportunities for training and career development than male engineers and non-token females. As depicted in Table 7, no statistically significant differences between female engineers and male engineers were found in the area of training and career development $t(655) = .39$. However, non-token females were significantly more favorable than female engineers in this area $t(655) = 4.75$. In short, Hypothesis 5 is partially supported.

Table 3

Planned Comparison Results/Group Means and Standard Deviations for Supervision.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	622	31.83	7.89	FE vs ME	.84	1.51	740	.131	.003
ME	88	33.10	7.45	FE vs NTF	1.51	3.36	740	.001	.015
NTF	33	36.91	4.11						

Table 4

Planned Comparison Results/Means and Standard Deviations for Involvement and Participation.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	1435	14.64	3.21	FE vs ME	.22	3.60	1710	.000	.003
ME	241	15.45	3.21	FE vs NTF	.57	3.02	1710	.003	.005
NTF	37	16.35	3.13						

Table 5

Planned Comparison Results/Group Means and Standard Deviations for Diversity.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	443	35.31	6.74	FE vs ME	.69	4.48	538	.000	.036
ME	74	38.40	5.22	FE vs NTF	1.29	2.70	538	.007	.013
NTF	24	38.79	5.88						

Hypothesis 6: Pay and Recognition

It was predicted female engineers would be significantly less satisfied than male engineers and non-token females with the recognition and pay they receive. However, no statistically significant differences were found between female engineers and male engineers $t(1289) = .25$ and between female engineers and non-token females $t(1289) = 1.75$ (please refer to Table 8). Thus, Hypothesis 6 is not supported.

Hypotheses 7: Job Satisfaction

It was expected male engineers and non-token females would report significantly higher levels of overall job satisfaction than female engineers. The results indicated that female engineers were significantly less favorable than male engineers $t(1820) = 2.47$ and non-token females $t(1820) = 4.21$ in the Job Satisfaction category as illustrated in Table 9. Therefore, Hypothesis 7 is supported.

Hypothesis 8: Communication

It was hypothesized female engineers would feel significantly less comfortable communicating thoughts and opinions compared with male engineers and non-token females. Results for Hypothesis 8 were analyzed on an item by item basis due to the low alpha value as previously discussed (please see Table 10). Only one item regarding communication indicated a significant difference. Female engineers were actually more favorable $t(1632) = 2.69$ than non-token females when asked about the effort made to get the opinions and thinking of employees in the company. Nevertheless, this result was in the opposite direction of what was hypothesised. Thus, Hypothesis 8 is not supported.

Hypothesis 9: Working Relationships

It was anticipated male engineers and non-token females would rate items in the Working Relationships category significantly more positive than female engineers. Similar to the previous hypothesis, results for Hypothesis 9 were also analyzed on an

Table 6

Planned Comparison Results/Group Means and Standard Deviations for Performance Appraisal Process.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	1595	14.69	4.64	FE vs ME	.32	.96	1867	.336	.000
ME	227	14.38	4.52	FE vs NTF	.72	5.53	1867	.000	.016
NTF	48	18.65	3.16						

Table 7

Planned Comparison Results/Group Means and Standard Deviations for Training and Career Development.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	523	18.81	5.33	FE vs ME	.58	.39	655	.693	.000
ME	104	19.04	5.50	FE vs NTF	1.11	4.75	655	.000	.033
NTF	31	24.10	4.72						

Table 8

Planned Comparison Results/Group Means and Standard Deviations for Pay and Recognition.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	1110	10.71	3.34	FE vs ME	.28	.25	1289	.805	.000
ME	147	10.78	3.23	FE vs NTF	.61	1.75	1289	.081	.002
NTF	35	11.77	2.82						

Table 9

Planned Comparison Results/Means and Standard Deviations for Job Satisfaction.

Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	1513	29.59	5.97	FE vs ME	.38	2.47	1820	.014	.003
ME	258	30.53	5.63	FE vs NTF	.86	4.21	1820	.000	.009
NTF	52	33.21	5.21						

Table 10

Planned Comparison Results for Communication Questions.

Contrast Q6 "Safe to Speak Up"									
Group	n	M	SD	Contrast	SE	t	df	p	r2
FE	312	2.77	.85	FE vs ME	.05	1.35	2307	.177	.000
ME	1944	2.84	.90	FE vs NTF	.13	.91	2307	.362	.000
NTF	54	2.89	.74						
Contrast Q21 "Free to Go Higher in Authority"									
FE	319	2.54	.92	FE vs ME	.06	1.02	2314	.306	.000
ME	1944	2.60	.96	FE vs NTF	.14	1.02	2314	.309	.000
NTF	54	2.69	.91						
Contrast Q34 "Little Effort to Get Opinions and Thinking"									
FE	225	2.09	.72	FE vs ME	.05	1.23	1632	.221	.000
ME	1370	2.02	.74	FE vs NTF	.13	2.69	1632	.007	.000
NTF	40	1.75	.44						

item by item basis due to a low alpha value. As noted in Table 11, two of the five items revealed male engineers had significantly higher levels of satisfaction compared to female engineers. These items were: "The people I work with usually get along well together" $t(2521) = 3.89$ and "People are treated with respect at XYZ Company, regardless of their job" $t(2315) = 4.96$. Further, two items indicated significant differences between female engineers and non-token females. These items were: "The people I work with usually get along well together" $t(2521) = 3.02$ and "In your experience, how successful is XYZ Company in putting the teamwork value into practice $t(2633) = 3.87$. In short, Hypothesis 9 is partially supported.

Discussion

The purpose of this study was to investigate the experiences of females working in the male-dominated environment of engineering. Specific work environment factors examined included: Supervision, Involvement and Participation, Diversity, Performance Appraisal, Training and Career Development, Pay and Recognition, Job Satisfaction, Communication, and Working Relationships. It was hypothesized that female engineers would be significantly less satisfied than male engineers and non-token females on the noted work environment dimensions due to their token status.

Overall Findings

Results confirmed female engineers would report significantly less opportunities for involvement and participation than male engineers and non-token females (Hypothesis 2). Survey scores for female engineers also indicated they were less inclined than male engineers and non-token females to report company management is supportive of workplace diversity (Hypothesis 3). In addition, female engineers reported lower levels of overall job satisfaction (Hypothesis 7), and had less favorable opinions on several

Table 11

Planned Comparison Results for Working Relationships Questions.

Contrast Q4 "People Get Along"									
Group	n	M	SD		SE	t	df	p	r2
FE	345	3.28	.76						
ME	2118	3.43	.63	FE vs ME	.04	3.89	2521	.000	.005
NTF	61	3.56	.56	FE vs NTF	.09	3.02	2521	.003	.003
Contrast Q19 "People are Treated with Respect"									
FE	324	2.51	.87						
ME	1941	2.75	.82	FE vs ME	.05	4.96	2315	.000	.010
NTF	53	2.74	.86	FE vs NTF	.12	1.85	2315	.064	.001
Contrast Q32 "Relations Between Different Races are Good"									
FE	127	2.21	.45						
ME	802	2.10	.35	FE vs ME	.03	3.40	950	.001	.012
NTF	24	2.08	.28	FE vs NTF	.08	1.62	950	.106	.002
Contrast Q43 "People Willing to Help Each Other"									
FE	342	3.24	.76						
ME	2122	3.30	.64	FE vs ME	.04	1.61	2517	.109	.001
NTF	56	3.21	.65	FE vs NTF	.09	.27	2517	.788	.000
Contrast Q106D "Teamwork Value is Practiced"									
FE	361	2.66	1.01						
ME	2214	2.58	.98	FE vs ME	.06	1.43	2633	.154	.000
NTF	61	2.13	.90	FE vs NTF	.14	3.87	2633	.000	.005

items regarding working relationships compared with male engineers and non-token females (Hypothesis 9).

Several hypotheses, however, were either not supported or just partially supported by the results of this study. No significant differences were found between female engineers and male engineers or non-token females with the pay and recognition they receive (Hypothesis 6). Similarly, female engineers were not significantly less satisfied than male engineers or non-token females on several items regarding communication (Hypothesis 8). On the other hand, while no significant differences were found between female and male engineers regarding training and career development (Hypothesis 5), supervision (Hypothesis 1), and performance appraisal (Hypothesis 4), female engineers were significantly less satisfied than non-token females in these categories.

Supported Hypotheses

Hypothesis 2: Involvement and Participation. The first hypothesis supported by the results of this study predicted that female engineers would report significantly less opportunities for involvement and participation compared with their male counterparts and non-token females. Female engineers indicated they were allowed less input before changes were made that would affect their job. Further, survey scores for the three comparison groups illustrate female engineers were less likely to report that differing opinions were openly discussed in reaching decisions in their work team, and that their contributions were considered important. These findings lend support to Wolman and Frank's study (1975) which found that solo women in peer groups were perceived as "deviant." In that study, men made attempts to exclude the solo female, labeled her assertiveness as "bitchiness" or "manipulation," and were more threatened by competition with her than with each other.

If in fact female engineers in the current organization have experienced similar attitudes from their male coworkers, it seems logical they would feel their opportunities for involvement and participation are stifled. Unfortunately, the negative effects are not simply to the detriment of female engineers, but to the organization as a whole as well. Any time employees are reluctant to provide insight, knowledge, and opinions on a particular matter, the organization potentially misses out on something valuable. The more information an organization has available to consider, the more likely its decisions will be informed. This is especially important to the field of engineering where the more creativity, knowledge, views, and ideas put into a product's design, for example, the better the product will be. In short, XYZ Company is potentially missing out on the valuable knowledge and ideas its female engineers can bring to the table simply because they aren't comfortable or encouraged to do so.

Hypothesis 3: Diversity. A second hypothesis supported by the data in this study predicted that female engineers would rate the work environment as significantly less accepting of diversity compared to male engineers and non-token females. In fact, female engineers were less inclined than male engineers and non-token females to report that management supports equal employment opportunities. Further, survey scores for female engineers revealed they were less favorable than male engineers and non-token females regarding their working environment and its acceptance of differences in race/ethnicity, gender, religion, age, disability, sexual orientation, marital status and job function.

Based on these results, it appears more work needs to be done in the diversity area at XYZ Corporation. According to Gardenswartz and Rowe (1993), dealing with diversity is an evolutionary process. Further, according to Copeland (1988), it must be managed deliberately and skillfully: "If you put people together, they won't necessarily learn to

like each other; in fact, the interaction may be unsuccessful and may only exaggerate stereotypes. But if before you bring them together, you give them some training (including exposure to different values and styles) and then give them a task that requires cooperation, and manage that interaction, results are much better. It can't be left to chance" (p. 46).

According to Burke (1991), minority employees working in organizations more supportive of diversity (e.g., had initiatives to hire and develop minorities and had few obstacles or difficulties in advancing minorities), were more satisfied with their job, career, and the company as a whole, and were more committed to their organizations. Further, should women make up a small percentage of their department, job function, etc. (i.e., less than 15%) it is even more likely, as evidenced in this study, they will have significantly lower levels of satisfaction in various work environment factors compared to the majority gender - men. It is in XYZ Company's best interest to improve female engineers' job satisfaction levels (as evidenced by the results of hypotheses 7) because low job satisfaction will eventually lead to increased turnover of a much valued workforce. Therefore, by launching diversity initiatives, as Burke suggests, XYZ would be taking a step in the right direction to increase the job satisfaction of female engineers, and thereby lessen turnover among these highly valued and sought-after employees.

Hypothesis 7: Job Satisfaction. Another hypothesis supported by the results of this study predicted that male engineers and non-token females would report significantly higher levels of overall job satisfaction compared to female engineers. These findings lend support to the idea that female employees will derive less satisfaction in their job due to their token status. In this study, women constitute just 14% of engineers within the company. Responses to questions in the Job Satisfaction category indicated female engineers were less likely than male engineers and non-token females to report the

morale in their department was generally high. Further, female engineers reported there were less opportunities to input their ideas, were less likely to report they were treated with respect and fairness, and were less satisfied with the people they work with compared to male engineers and non-token females.

Data from the current study parallel the results of a study conducted by Cassidy and Warren (1991) which found that employees in gender-consistent occupations where their gender represents the majority, exhibited significantly higher levels of work satisfaction compared to those in gender inconsistent occupations. Further, O'Farrell and Harlan (1982) found that perceived male coworker hostility significantly reduced the job satisfaction of blue-collar women working in a male majority occupation. Given the significantly lower job satisfaction scores for female engineers in the current study, perhaps they perceive resentment from their male coworkers or are subject to various forms of harassment as well. If this is the case, XYZ Company will likely experience a turnover rate among female engineers that is higher than male engineers or other females in the organization. Further, if female engineers are contemplating leaving the organization, their productivity is likely to be reduced. As a result, the negative effects of lower job satisfaction among female engineers can transcend to the company as a whole in the form of turnover, which leads to an increased need for recruitment and training, both of which are costly to the organization.

Hypothesis 9: Working Relationships. Female engineer responses were significantly less favorable than male engineers and non-token females when asked if the people they work with usually get along well together. Further, results for female engineers were significantly less favorable than for male engineers when asked if people were treated with respect, regardless of their job. On the other hand, when respondents were asked if the relations between people of different races or ethnic backgrounds were

usually good, female engineers were significantly more favorable than male engineers on this item.

Responses for female engineers were also significantly more favorable than the responses for non-token females when asked how successful the company was in putting the teamwork value into practice (i.e., shared values and focus; teamwork, internal and external, mutual benefits, mutual respect). This difference may be a direct result of the different characteristics between the engineering and administrative job functions. In engineering, teamwork is a day-to-day aspect of the job and is critical to engineering's success. On the other hand, administrative/secretarial jobs (held by non-token females) involve work that is more solitary in nature and may only require working with more than one other person (usually their boss) periodically. Despite these differences between female engineers and non-token females, no significant differences were found between any of the groups when asked if people were willing to help each other, even it meant doing something outside their usual activities.

According to Copeland (1988), relationships are central to achievement, and being a member of the "club" is as important as hard work and competence. When a white man and a woman (or minority employee) are competing for a promotion, the decision maker may be heard to say, "I just don't know Mary as well as Bob" (Copeland, 1988). Most of us prefer to have lunch and socialize after work with people most like ourselves. As a result, people in the mainstream fail to include those who are different and thus exclude them from important information and relationships (Copeland, 1988). Perhaps this occurs to some extent in the organization examined in this study as illustrated not only by the differences in working relationships scores but also by the number of female engineers who are managers (13%) compared to the number of male engineers who are managers (21%).

Partially Supported/Unsupported Hypotheses

Hypothesis 1: Supervision. While it was hypothesized that female engineers would have significantly lower levels of satisfaction with their supervisor compared to male engineers and non-token females, survey scores found a significant difference to exist only between female engineers and non-token females for this category. Therefore, this hypothesis is just partially supported. It should be noted that overall, the average mean score for both female engineers ($\underline{M} = 3.18$) and male engineers ($\underline{M} = 3.31$) in this category are fairly high. Engineers in XYZ Company work in small teams where strong relationships with one's supervisor are fostered. Such close relationships may reduce the liklihood for for supervisors to treat their male and female employees differently, hence, the lack of a significant difference in survey scores between the female and male engineers.

Hypothesis 4: Performance Appraisal. Another hypothesis partially supported by the results of this study predicted that male engineers and non-token females would be significantly more satisfied with the performance appraisal process than female engineers. Results show that while non-token females are significantly more satisfied than female engineers regarding the performance appraisal process, there was no significant difference between female and male engineers. The current findings contradict those of Sackett et al. (1991) which showed that when women comprise less than 20% of a work group (such as female engineers in this study), their performance appraisal scores are lower than those of their male counterparts. Perhaps the lack of significant differences between the groups in this study are a result of the education level of female engineers. Isaacs (1981) found that women's work was not devalued when the raters learned the women held the prestigious title of "Dr." It is possible the female engineers in this study did not rate the performance appraisal process less favorably

compared to male engineers and non-tokens females because their job position as an engineer gives them more credibility in the mind of their performance raters. This credibility may negate the tendency for raters to evaluate female engineers' performance lower than their male counterparts.

Hypothesis 5: Training and Career Development. It was also hypothesized that women engineers would report significantly less opportunities for training and career development than male engineers and non-token females. While there was a significant difference between the scores for female engineers and non-token females, no significant difference was found between female and male engineers. These results conflict with the findings by Shostak (1985), O'Farrell & Harlan (1982), and Palmer and Lee (1990), which found that women were often excluded from both formal and informal training.

The current study's findings also conflict with the results of Jagacinski (1987) and Palmer and Lee (1990) which found that female engineers were less satisfied with their career advancement opportunities and that women felt there were better opportunities for men than women in engineering. A lack in significant difference between the male and female engineers in XYZ Company are found despite the fact that only 13% of female engineers are managers compared to 21% of male engineers. It is possible that opportunities for training and career development are distributed more equitably among the groups examined in this study because there is a growing shortage of employees in the labor pool who have the technical knowledge and training that organizations desperately need. As a result, opportunities for training and career development are perceived to be plentiful at XYZ Company, regardless of one's gender or race/ethnicity.

Hypothesis 6: Pay and Recognition. It was also predicted that female engineers would be significantly less satisfied than male engineers and non-token females with the pay and recognition they receive. The findings of this study did not support this

hypothesis. This conflicts with the findings of Jagacinski (1987) and Vetter (1981) who have found a gap in salary between male and female engineers to exist and increase with experience. While the College Placement Council (as cited in Robinson & McIlwee, 1989) found that women engineers received starting salaries equal to and even slightly greater than men, it appears that over time, a salary gap evolves and increases. Perhaps because the engineers in this study work for a government organization where salary ranges are standardized according to specific job grades, there is less opportunity for salary gaps to evolve. In addition, it is possible the salaries examined by the College Placement Council were from private sector organizations where salaries are less likely to be regimented leading to disparate pay between the genders.

Hypothesis 8: Communication. Hypothesis 8 predicted that female engineers would be less favorable than male engineers and non-token females on several survey questions regarding communication. While responses for female engineers were less favorable on two of the items, the differences were not statistically significant. Results for the remaining item, however, which asked if little effort was made to get the opinions and thinking of people in the company, reveal that female engineers were slightly (though not significantly) more likely than male engineers to report the company asks for employee opinions. Furthermore, female engineers were significantly more favorable than non-token females on this item - a finding in the opposite direction of what was hypothesized.

Summary

Significant differences between survey scores for female engineers (tokens) and male engineers and non-token females were found on a number of work environment factors. Compared to male engineers and non-token females, female engineers indicated they were allowed less input before changes were made that will affect their job, were less likely to report that differing opinions were openly discussed in reaching decisions in

their work team, and were less inclined to report their contributions are considered important. In addition, survey scores for the three comparison groups indicated female engineers were less likely than male engineers and non-token females to report both management and their work environment was supportive of diversity. In addition, female engineers were less inclined to report the people they work with usually get along well together and that people were treated with respect, regardless of their job. Finally, compared to male engineers and non-token females, female engineers reported lower department morale and opportunities to input their ideas.

Contrary to expectation, while female engineers were significantly less satisfied than non-token females with the supervision they receive, the performance appraisal process, and training and career development, no significant differences were found between female engineers and their male engineers in these areas. Finally, no significant differences arise between any of the groups regarding pay and recognition.

Strengths and Limitations

The current study possesses several strengths which should not go unnoticed. While the majority of studies regarding engineering have involved students, this study examines data from employees working in an established organization. Further, the organization under study has a stronger "engineering culture" due to the type of business it is in. This dominant engineering culture provided an excellent opportunity to examine the effects of tokenism on female engineers who work in such a traditionally male environment. Finally, because the data examined in this study were from the third annual Employee Opinion Survey, it is highly unlikely subjects "adjusted their responses" based on any notions that the data would be used in the way it has for this study. In other words, the data examined are likely to be the "true" opinions of employees in the company.

However, because this study examined data from an employee survey, there was limited flexibility for adding survey questions to provide further insight into the work environment topics examined. Likewise, it was not possible to specifically address additional issues covered in the preceding literature review (e.g., mentoring). While the results of this study indicate female engineers working in a traditionally male dominated environment are significantly less satisfied than both male engineers and non-token females on a number of work environment factors, namely: Job Satisfaction, Diversity, Involvement and Participation, and Working Relationships, the effect sizes of the planned comparisons are relatively small (ranging between .000 and .036). Further, while no significant differences are found between male and female engineers regarding Supervision, Performance Appraisal, and Training and Development, non-token females are significantly more favorable than female engineers in these areas. Again, it should be noted the effect sizes are relatively small (between .000 and .033).

Finally, in two categories where no significant differences were found between male and female engineers (Pay and Recognition and Performance Appraisal), the results have limited generalizability since the subjects are employed in a government sponsored organization. Specifically, pay and performance appraisal are likely to be much more regimented in a government organization compared to an organization in the private sector. Therefore, while no significant differences in favorability ratings are found between the engineering groups in these areas, it is possible differences would be found between similar groups in a private organization where the guidelines for pay and performance appraisal are more flexible, lending greater opportunity for biased and discriminatory practices.

Finally, it is also possible the lack of significant differences between female engineers and male engineers or non-token females in training and career development,

communication, and supervision, are partly the result of surveying the opinions of a highly qualified, educated, and talented workforce, where female tokens may have an easier time gaining the respect of their male counterparts. Further, it is possible female engineers in XYZ Company don't have to "prove themselves" as much as female tokens in other occupations such as blue-collar work, due to their higher level of education. In short, female engineers in XYZ Company might escape some of the pitfalls of tokenism due to their educational status and the credibility they receive from their coworkers and managers, simply by having attained graduate degrees in engineering and science and obtaining a job in their prestigious organization.

Recommendations for Organizations

In response to anticipated shortages in the labor market, many organizations will be driven to reassess their personnel practices, work environment, and managerial philosophy concerning women. As the labor pool shrinks, competitive pressure will force companies to provide women with equal access to employment opportunities. Women will also have greater access to pivotal jobs that lead up the corporate management ladder. A competitive edge will be gained by companies that focus on the recruitment and retention of women by devising successful approaches to enhancing female job satisfaction and motivation. Employment and promotion policies must be revised to ensure qualified women have a reasonable chance of pursuing a rewarding career without having to sacrifice their personal and family lives.

The corporate challenge is to be able to recruit and retain the best workers out of a diverse pool in order to stay competitive in an economy requiring an increasingly skilled workforce (Johnson & Packer, 1987). The results of the current study show XYZ Company fosters the negative effects of tokenism on several work environment factors. Given this data, it is recommended the company implement a program designed to

increase employee awareness of the existing biases that put women and/or minorities at a disadvantage. It is possible that employees and management think of engineering as a masculine field, benefiting from those possessing masculine work traits. By differentiating engineering from perceptions of the job's masculinity, perhaps differences in favorable response scores between male and female engineers would disappear. Moreover, the organization will be able to attract and retain employees from a larger pool of much needed skilled workers because neither men nor women are deterred from entering a given field due to ascribed "gender" characteristics.

Unfortunately, most managers continue to see diversity as a legal or social responsibility rather than a business issue. Diversity programs are seen as a luxury to be pursued when business results will allow it and put off when sales or profits decline. Until managers perceive a diversity program as critical to the company's success, they won't be sufficiently motivated to see it through. However, the responsibility of successfully integrating women and minorities into the workforce shouldn't just fall on company management. With effort on everyone's part (management, employees, and supervisors, alike) it is possible for workplaces and professions to foster and support environments that respect and value all employees.

Future Research

This study emphasizes the importance of surveying women employed in traditionally male occupations, where their numbers are proportionately less than the majority (males). A large amount of relevant research has been reviewed, and sheds additional light on the experiences of token females. Results provide a more complete picture of the work environments women can expect to encounter if they choose such work. Nonetheless, more research needs to be conducted on the specific problem areas - such as those identified in this study (i.e., involvement and participation, diversity,

overall job satisfaction, and working relationships) - women may encounter in traditionally male dominated jobs.

A similar study of male and female engineers in a private sector organization would provide valuable insight to any differences that may exist between government and private sector organizations. Moreover, if a researcher has the opportunity to collect data from token and non-token employees on the same survey questions from several independent organizations across various work sectors, specific effects of industry, organizational culture, etc., can be reduced. Further, a study examining the experiences of token minority engineers (e.g., African Americans, Asians, etc.) would prove highly valuable.

Research is also needed to explore the reasons and motivations behind men's reactions to women. Do men see their job security and wages threatened by women? Could instances where employers are perceived to use female labor to lower wages and prevent unionization provoke men's fear and resistance as Blalock suggests (as cited in Yoder, 1991)? In addition, research is needed to examine the attitudes and acceptance problems held by supervisors (though not evidenced in this study) and male coworkers towards women in male-dominated jobs. A detailed examination of these issues may identify the best mechanisms women can use to cope with acceptance problems as well as how to prevent problems from occurring in the future.

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Appendix A - Supporting Items for Hypotheses

Hypothesis 1: Supervision

3. My manager/supervisor does a good job of building teamwork.

18. My manager/supervisor shows favoritism to some people in my department.

30. My manager/supervisor works well with people who are different from him or her (e.g., gender, racial/ethnic background, personality).

80. Regarding suggestions for change, my manager/supervisor is usually:
    a. Receptive
    b. Responsive

89. My manager/supervisor:
    b. Is available when needed
    c. Manages people well
    d. Works with me to establish performance goals
    e. Gives me adequate feedback on my performance
    f. Maintains effective discipline

Hypothesis 2: Involvement and Participation

5. I have the opportunity for input before changes are made which will affect my job.

67. I think my contributions are considered important at XYZ Company.

74. Differing opinions are openly discussed in reaching decisions in my work team.

83. My manager/supervisor involves me in:
    a. Planning the work of my department
    b. Solving problems related to our work

Hypothesis 3: Diversity

26. I feel that XYZ Company management as a whole supports equal opportunity for all XYZ employees.

64. The Diversity Program is making real progress at XYZ Company.

97. XYZ Company provides a working environment that is accepting of differences in:
    a. Job function
    b. Race/ethnicity
    c. Gender
    d. Religion
    e. Age
    f. Disability
    g. Veteran status
    h. Sexual orientation
    i. Marital status

106. In your experience, how SUCCESSFUL is XYZ Company in putting each value into practice at the present time:
    e. RESPECT FOR THE INDIVIDUAL: Trust and empowerment; individuality, diversity; individual sensitivity; focus on accomplishments

Hypothesis 4: Performance Appraisal

22. I think my performance on the job is evaluated fairly.

70. I understand how my performance on the job is evaluated.

102. How do you rate your last performance review on the following:
    a. Helping you identify your strengths and weaknesses
    b. Helping you improve your job performance
    c. Helping you in your career development and planning

Hypothesis 5: Training and Career Development

8. There is adequate opportunity for people to learn about available job openings.

23. XYZ Company does a good job of promoting the best-equipped and skilled people to be managers/supervisors.

49. I am satisfied with the career coaching I receive at XYZ Company.

52. I think XYZ Company offers long-term career opportunities for me.

56. The criteria for advancing in your career at XYZ Company are applied to everyone in a consistent manner.

75. Movement outside the job posting system occurs in a fair manner.

82. There are sufficient opportunities for me to receive:
    a. Training to improve my skills in my current job
    b. Training to increase my eligibility for another job

Hypothesis 6: Pay and Recognition

37. My manager/supervisor seldom gives me recognition for work done well.

84. I think I am fairly paid compared with:
    b. Other people in my department
    c. People in other departments in my job classification
    d. Others throughout XYZ Company who perform the same or similar work

Hypothesis 7: Job Satisfaction

13. I would recommend XYZ Company as a good place to work.

27. My work gives me a sense of personal accomplishment.

40. Morale in my department is generally high.

61. My job offers little opportunity to use my abilities/skills.

105. How satisfied are you with these aspects of your current job:
    e. Advancement opportunities
    f. The opportunity to input your ideas
    g. Recognition for performance
    h. The people you work with
    i. Being treated with respect and fairness

Hypothesis 8: Communication

6. Most of the time it is safe to speak up at XYZ Company.

21. If I were dissatisfied with my manager's/supervisor's decision on an important matter, I would feel free to go to someone higher in authority.

34. Little effort is made to get the opinions and thinking of people at XYZ Company.

Hypothesis 9: Working Relationships

4. The people I work with usually get along well together.

19. People are treated with respect at XYZ Company, regardless of their job.

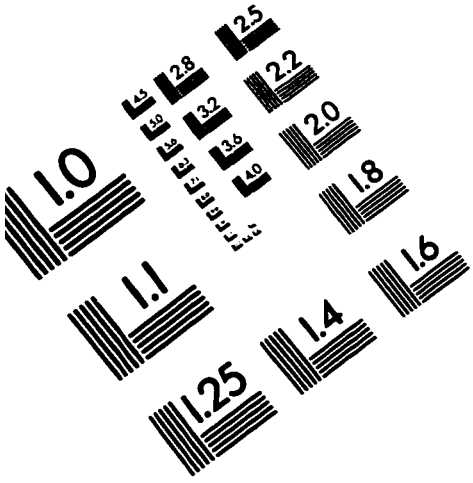
32. The relations between people of different races or ethnic backgrounds are usually good.

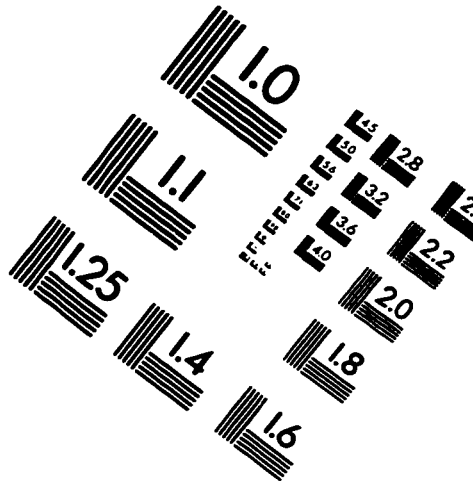
43. The people I work with are willing to help each other, even if it means doing something outside their usual activities.

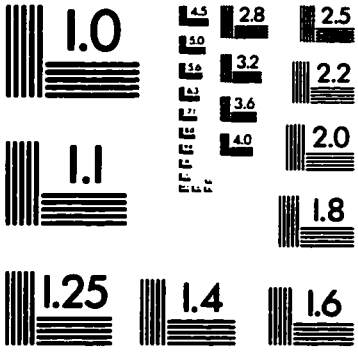
106. In your experience, how SUCCESSFUL is XYZ Company in putting each value into practice at the present time:
    d. TEAMWORK: Shared values and focus; teamwork, internal and external, mutual respect.

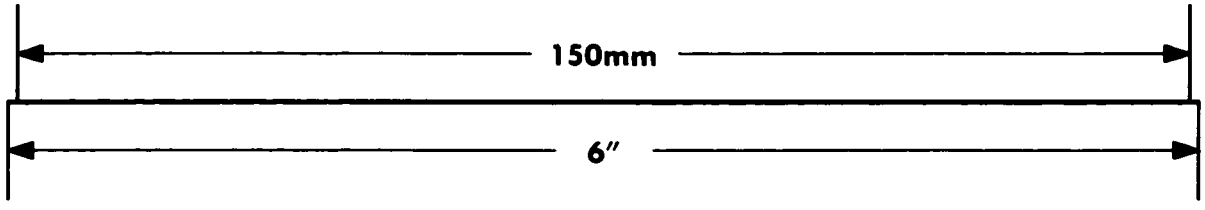
Appendix B - Questionnaire

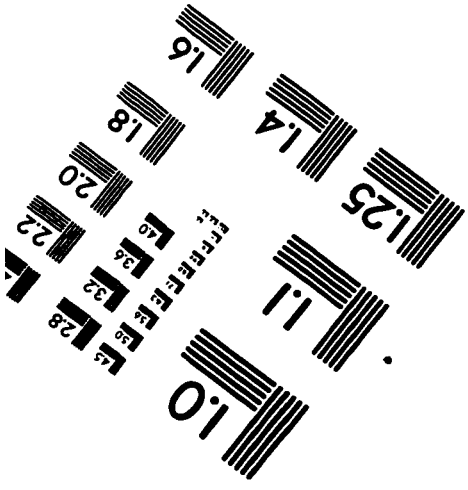
IMAGE EVALUATION TEST TARGET (QA-3)

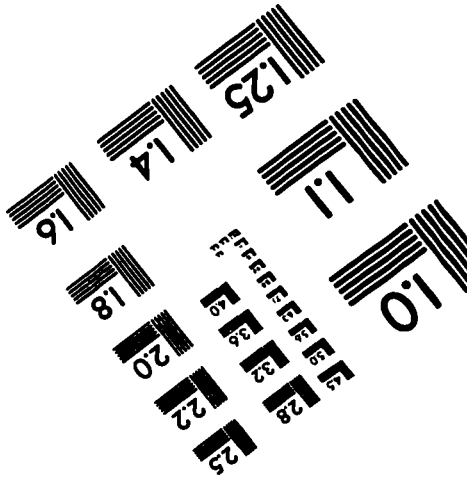












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